THE

ECLECTIC REPERTORY,

AND

ANALYTICAL REVIEW.

VOL. I. OCTOBER, 1810. No. I.

SELECTED PAPERS.

Observations on the Distemper in Dogs.

BY EDWARD JENNER, M. D. F. R. S.

From the Medical and Chirurgical Transactions.

THAT disease among dogs which has familiarly been called "the distemper," has not hitherto, I believe, been much noticed by medical men. My situation in the country favouring my wishes to make some observations on this singular malady, I availed myself of it during several successive years, among a large number of fox hounds belonging to the earl of Berkeley; and from observing how frequently it has been confounded with hydrophobia, I am induced to lay the result of my inquiries before the Medical and Chirurgical Society.—It may be difficult, perhaps, precisely to ascertain the period of its first appearance in Britain. In this and the neighbouring counties, I have not been able to trace it back much beyond the middle of the last century; but it has since spread universally. I knew a gentleman who, about forty-five years ago, destroyed the greater part of his hounds, from supposing them mad, when the distemper first broke out among them; so little was it then known by those the most conversant with dogs. On the continent, I find it has been known for a much longer period. It is as contagious among dogs as the small-pox, measles, or scarlet

fever among the human species; and the contagious miasmata, like those arising from the diseases just mentioned, retain their infectious properties a long time after separation from the distempered animal. Young hounds, for example, brought in a state of health into a kennel where others have gone through the distemper, seldom escape it. I have endeavoured to destroy the contagion, by ordering every part of a kennel to be carefully washed with water, then white-washed, and finally to be repeatedly fumigated with the vapour of marine acid; but without any good result.

The dogs generally sicken early in the second week after exposure to the contagion. It is more commonly a violent disease than otherwise, and cuts off, at least, one in three that is attacked by it. It commences with inflammation of the substance of the lungs, and generally of the mucous membrane of the bronchiæ. The inflammation at the same time seizes on the membranes of the nostrils, and those lining the bones of the nose; particularly the nasal portion of the ethmoid bone. These membranes are often inflamed to such a degree, as to occasion extravasation of blood, which I have observed coagulated on their surface. The breathing is short and quick, and the breath is often fetid. The teeth are covered with dark looking mucus. There is frequently a vomiting of a glary fluid. The dog commonly refuses food, but his thirst seems insatiable, and nothing seems to cheer him like the sight of water. The bowels, though generally constipated as the disease advances, are frequently affected with the diarrhœa at its commencement. The eyes are inflamed; and the sight is often obscured by mucus secreted from the eye-lids, or by opacity of the cornea. The brain is often affected as early as the second day after the attack. The animal becomes stupid, and his general habits are changed. In this state, if not prevented by loss of strength, he sometimes wanders from his home. He is frequently endeavouring to expel, by forcible expirations, the mucus from the trachea and fauces, with a peculiar rattling noise. His jaws are generally smeared with it, and it sometimes flows out in a frothy state, from his frequent champing. During the progress of the disease, especially in its advanced stages, he is disposed to bite and gnaw any thing within his reach. He has sometimes epileptic fits, or quick successions of general, though

slight convulsive spasms of the muscles. If the dog survives, this affection of the muscles continues through life. He is often attacked with fits of a different description. He first staggers, then tumbles, rolls, cries as if whipped, and tears up the ground with his teeth and fore feet. He then lies down senseless and exhausted. On recovering he gets up, moves his tail, looks placid, comes to a whistle, and appears in every respect much better than before the attack. The eyes, during this paroxysm, look bright, and unless previously rendered dim by mucus, or opacity of the cornea, seem as if they were starting from the sockets. He becomes emaciated, and totters from feebleness in attempting to walk, or from a partial paralysis of the hind legs. In this state, he sometimes lingers on till the third or fourth week, and then either begins to show signs of returning health (which seldom happens when the symptoms have continued with this degree of violence) or expires. During convalescence, he has sometimes, though rarely, profuse hæmorrhage from the nose. When the inflammation of the lungs is very severe, he frequently dies on the third day. I knew one instance of a dog's dying within twenty-four hours after the seizure, and in that short space of time the greater portion of the lungs was, from exudation, converted into a substance nearly as solid as the liver of a sound animal. In this case, the liver itself was considerably inflamed, and the eyes and flesh universally were tinged with yellow, though I did not observe any thing obstructing the biliary ducts. In other instances, I have also observed the eyes looking yellow.

The above is a description of the disease in its severest form; but in this, as in the diseases of the human body, there is every gradation in its violence. There is also another affinity to some human diseases, viz. that the animal which has once gone through it, very rarely meets with a second attack. Fortunately, this distemper is not communicable to man. Neither the effluvia from the diseased dog, nor the bite, have proved in any instance infectious; but as it has often been confounded with canine madness, as I have before observed, it is to be wished that it were more generally understood; for those who are bitten by a dog in this state, are sometimes thrown into such perturbation, that hydrophobic symptoms have actually arisen from the workings of the imagination. Mr. John Hunter used

to speak of a case somewhat of this description in his lectures.* Having never, to a certainty, seen a dog with hydrophobia, I am of course unable to lay down a positive criterion for distinguishing between that disease and the distemper, in the precise way I could wish; but if the facts have been correctly stated, that in hydrophobia the eye of the dog has more than ordinary vivacity in it, and as the term implies, he refuses to take water, and shudders even at the sight of it, while in the distemper he looks dull and stupid, is always seeking after water, and never satisfied with what he drinks, there can be no loss for a ready discriminating line between the two diseases.

March 21, 1809.

Two cases of Small-Pox Infection communicated to the Fœtus in Utero under peculiar circumstances,

With additional Remarks.

BY EDWARD JENNER, M. D. F. R. S.

From the Medical and Chirurgical Transactions.

IN my second† and third treatises‡ on the vaccine disease, I endeavoured to call the attention of my readers to some physiological facts respecting the nature of the small-pox infection which I considered of great importance, foreseeing that they would eventually become connected with vaccination.

My own observations, and the accumulated evidence of others, have furnished me with numerous instances of incontestible, and sometimes violent symptoms of small-pox occurring in persons who had previously gone through the disease, either in the natural way or by inoculation, mildly or severely.

* A gentleman who received a severe bite from a dog, soon after fancied the animal was mad. He felt a horror at the sight of liquids, and was actually convulsed on attempting to swallow them. So uncontrollable were his prepossessions, that Mr. Hunter conceived he would have died, had not the dog which inflicted the wound been fortunately found and brought into his room in perfect health. This soon restored his mind to a state of tranquillity. The sight of water no longer affected him, and he quickly recovered.

† Further observations on the Variolæ Vaccinæ, published in 1799.

‡ A continuation of Facts and Observations on the Variolæ Vaccinæ, published in 1800.

The skin we know is ever ready to exhibit, though generally in a very limited degree, the effects of the poison when inserted there, and how frequently do we see eruptions on persons much exposed to the contagion, and these sometimes preceded by sensible illness! Yet should any thing like an eruption appear, or the smallest degree of indisposition occur on the insertion of the variolous matter in those who have gone through the cow-pox, my assertions respecting the peculiarities of the disease might be unjustly discredited.

In the publications above mentioned, I have given the particulars of several instances of severe disease from variolous contagion, occurring in persons who had incontestibly gone through every stage of small-pox at a former period. The subjects of three of these cases were medical practitioners, two of whom had inoculated themselves by way of experiment, and the other received the disease by the contagious effluvia of a patient, in the course of an assiduous attendance. In another case, the subject was a nurse-maid, who also caught the disease by effluvia; and in another, extracted from the Memoirs of the Medical Society, (which is one of the most remarkable cases on record) the patient had the small-pox a second time with such severity as proved fatal, though the first attack had been of the most malignant kind.

These circumstances have led me to entertain the opinion, that the susceptibility to receive variolous contagion always remains through life, but under various modifications or gradations, from that point where it passes silently and imperceptibly through the constitution (as is frequently the case with cow-pox) up to that where it appears in a confluent state, and with such violence as to destroy life.

It is only under particular circumstances, that any proof of the presence of small-pox can be adduced in those cases, in which it passes through the frame without producing eruptions, or in any perceptible degree disturbing the animal functions. Such proof however, is afforded by the obvious infection of the fœtus before birth communicated through the mother, herself being already secure from any visible occurrence of the disorder.

The following remarkable cases will exemplify this fact.

About five years ago, I was requested by Dr. Croft to vaccinate the infant of Mrs. W. a lady in Portland Place. The vaccine fluid, which was inserted fresh from the arm of another infant, produced scarcely any effect beyond a little efflorescence on the part, which in a few days disappeared. On expressing my surprise at this, such an occurrence happening very rarely, Mrs. W. soon removed my embarrassment, by the following narrative.

A few days previous to her confinement, she met a very disgusting object, whose face was covered with the small-pox. The smell and appearance of the poor creature affected her much at the time; and though she mentioned the circumstance on her return home, she had no idea that her infant could suffer from it, having had the small-pox herself when a child. During a few days after its birth, the little one seemed quite well, but on the fifth day it became indisposed, and on the seventh the small-pox appeared. The pustules, which were few in number, maturated completely. Dr. Croft, who attended her, being curious to know the effect of inoculation from one of the pustules, put some of the matter taken from them, into the hands of a gentleman eminently versed in that practice, which produced the disease correctly. Mrs. W. was not sensible of any indisposition herself from this exposure, nor had she any appearance of the small-pox.

This case then decisively proves, that the small-pox virus may affect the human frame, even to its inmost recesses, although apparently secured from its effects, and yet give no evidence of its presence by exciting any perceptible disorder.

Another case, in its general character similar to the above, was lately communicated to me by Mr. Henry Gervis, a surgeon of eminence at Ashburton, in Devonshire. Mr. Gervis says, "The small-pox having appeared in the village of Woolson Green, about three miles from Ashburton, on the 6th of May, 1808, I vaccinated a poor woman, the wife of James Baskwell, who was in the last month of her pregnancy. Her three children had been inoculated the preceding day with variolous matter by the surgeon who attended the poor of the parish, and who had very properly declined inoculating her also from her particular situation. I made two punctures in each arm, each of which fortunately succeeded, and she regularly

passed the disorder, complaining only on the tenth and eleventh days, when the areola was most extended as is usual. I saw her very frequently during the progress of her disorder, and once or twice after its complete termination: I therefore can speak positively, that during that time she laboured under no symptom but what is connected with the cow-pox. From this period she continued perfectly well, and on Saturday last the 11th instant, she was delivered of a female child, having at the time of its birth many eruptions on it, bearing much the appearance of small-pox in the early stage of the disease. This event happened five weeks after her vaccination, and one month after she had been exposed to the variolous infection of her own three children, and that of several other persons in the same village. On the 14th I visited the child again, when I found the eruptions had increased to some thousands, perfectly distinct, and their character well marked. Many among the most respectable physicians and surgeons from Totness, Ashburton, and the neighbourhood, were kind enough, at my request, to come to the poor woman's place of abode, and witness the fact. But to put the matter beyond all doubt, I armed some lancets with the virus, and produced the small-pox by inoculating with it. On the 18th the infant was seized with slight convulsions, and on the morning of the 19th it expired.

" In addition to the circumstance of the mother's conveying the variolous infection to her unborn child, without feeling any indisposition from its action on her own constitution, I must remark that there cannot be a stronger proof of the efficacy of vaccine inoculation than this case affords. But happily proofs are not wanted, or I could give my testimony to a great extent."

Without producing more examples of a similar description at present, though many are before me, I shall conclude by observing, that a fact not unlike the preceding fell under the observation of Dr. Mead, who, in his discourse on the small-pox (chap. iv. page 337, edit. 1772) says, " A certain woman, who had formerly had the small-pox, and was now near her reckoning, attended her husband in the distemper. She went her full time, and was delivered of a dead child. It may be needless to observe that she did not catch it on this occasion; but the dead body of the infant was a horrid sight, being all

over covered with the pustules; a manifest sign that it died of the disease before it came into the world."

My principal object in the foregoing observations is, to guard those who may think fit to inoculate with variolous matter, after vaccination, from unnecessary alarms: a pustule may sometimes be thus excited, as on those who have previously gone through the small-pox; febrile action in the constitution may follow; and, as has been exemplified, a slight eruption.

At the commencement of vaccination I deemed this test of security necessary; but I now feel confident that we have one of equal efficacy, and infinitely less hazardous, in the re-insertion of the vaccine lymph.

November 18, 1808.

A case of Aneurism of the Carotid Artery.

BY ASTLEY COOPER, ESQ. F. R. S. SURGEON TO GUY'S HOSPITAL.

From the Medical and Chirurgical Transactions.

MARY EDWARDS, aged 44, was brought to my house by Mr. Robert Pugh, of Gracechurch-street, that I might examine a tumor in the neck, which was obviously an Aneurism of the right Carotid Artery. I advised her to become a patient in Guy's Hospital, and she was admitted on the 23d of October, 1805. The account she gave of the disease was, that the tumor appeared five months before, situated rather above the middle of the neck; its size at first being only that of the end of the finger; that it beat with very great force, and occasioned a strong pulsation in the brain; that it gradually increased upwards, until it reached the lower jaw, and extended downwards below the middle of the neck; that for a fortnight previous to her admission, the pulsation in it and the brain had been so strong as to prevent her sleeping; that the scalp on that side was tender, so as scarcely to bear the touch; that she had great difficulty in taking any solid food, and was constantly teazed with a violent cough.

Upon examination of the swelling I found that it occupied two-thirds of the neck; it had a very strong pulsatory motion, and the skin was thin at its most prominent part. When the

swelling was examined at the hospital, great doubts were entertained if there was sufficient space between the clavicle and the tumor for the application of a ligature, and as her husband objected to the operation, she quitted the hospital.

In a few days, hearing that all her symptoms were increased, I called at her house, and strongly pointing out the probability of a fatal termination of the disease, I gained her consent and that of her relations to an operation.

On Friday, November 1st, 1805, the operation was performed in the presence of Mr. Pearce, surgeon, and Mr. Owen, apothecary to the Universal Dispensary, Ratcliffe Highway, of Mr. Travers, surgeon, and that of five other medical gentlemen.

The tumor at this time reached from near the chin beyond the angle of the jaw, and extended downward to within two and a half inches of the clavicle. I made an incision two inches long, on the inner edge of the sterno-mastoid muscle, from the lower part of the tumor to the clavicle, which laid bare the omo- and sterno-hyoideus muscles, which being drawn aside toward the trachea, exposed the jugular vein. The motion of this vein produced the only difficulty in the operation, as under the different states of breathing it sometimes presented itself to the knife, tense, and distended, and then as suddenly collapsed. Passing my finger into the wound to confine that vein, I made an incision upon the carotid artery, and having laid it bare, I separated it from the par vagum, and introduced a curved aneurismal needle under it, taking care to exclude the recurrent nerve on the one hand, and the par vagum on the other. The two threads were then tied about half an inch asunder, being the greatest distance to which they could be separated; I thought it proper not to run the risk of a hemorrhage by dividing the artery, as I was fearful the ligatures would be thrown off by the force of the heart, and the distance was too small to allow of any means being used to prevent it. As soon as the threads were tied, all pulsation in the tumor ceased, and the operation being concluded, and the wound superficially dressed, she rose from the chair in which she sat during the operation, and was immediately seized with a fit of coughing, which I thought would have terminated her existence. This seemed to arise from an accumulation of mucus in the trachea, which

she could not expel; it continued about half an hour when she became more tranquil.

Saturday, *Nov.* 2.—Mr. Owen, who had sat up with her, reported that she had slept six hours during the night, but was now and then disturbed by her cough. The pulsation in the tumor has not returned; that in the brain has ceased, and there is no appearance of diminution of nervous energy in any part of the body.

Sunday, *Nov.* 3.—Last night as she had some pain in her head, leeches were applied. To-day the pain in her head is gone; her cough is less troublesome; her stools and urine are natural; pulse 96.

Monday, *Nov.* 4.—Slept six hours last night; her spirits are good; pulse 100.

Tuesday, *Nov.* 5.—In the afternoon, I found her, as may be supposed contrary to my orders, sitting before the fire with three other persons, drinking tea which she swallowed with great difficulty; she had no pain in her head; her pulse 96, and the only circumstance of which she complains, is that her cough is troublesome.

Wednesday, *Nov.* 6.—In a violent fit of coughing last night, a slight discharge of venous blood took place from the wound. Mr. Hopkie, of Ratcliff-Highway, was called to her; but the bleeding ceased with the cough, and a piece of lint was laid lightly on the wound; in the afternoon her cough was less troublesome; her pulse only 92.

Thursday, *Nov.* 7.—My colleague, Mr. Forster, accompanied me to see her and to make a drawing of the tumor, which he thought was reduced one-third. She slept eight hours last night; her pulse 94.

Friday, *Nov.* 8.—Evening; I was sent for by Mr. Owen and Mr. Roberts, who alternately sat up with her, on account of their observing, that her left arm and leg were paralytic. I found them benumbed, and she moved them with great difficulty; but as her pulse was weak, and she laboured under considerable constitutional irritation, I thought the powers of these parts would be restored as her health improved. She had passed a very restless night, complaining that her bones were sore, and that her teeth felt as if softened. Her head is free from pain.

Saturday, Nov. 9.—Her cough is less troublesome; her pulse is 90; her spirits good; she talks with cheerfulness, and moves her arm with more facility than yesterday. She slept eight hours last night; she said she must have something to eat, but upon attempting to swallow solids she was incapable of doing so. She has no pain either in the head or tumor, but says, when she coughs she feels a pricking pain in the wound.

Sunday, Nov. 10.—I did not see her.

Monday, Nov. 11.—She had passed a good night; her left arm she now moves with more facility, but I thought with not quite so much ease as the other. She is in good spirits, and has some appetite, but cannot swallow solids. Her chief sustenance is arrow root, to which, as she had been very much accustomed to take spirits, a little wine is added.—Her cough is sometimes very violent; her pulse is only 84; the ligatures are projecting further from the wound, than at any time since the operation.

Tuesday, Nov. 12.—My colleague, Mr. Lucas, accompanied me to see the woman, this day. We found her in good spirits, and the pulse only 82; her cough less troublesome, and she was able to sit up and use her arm with so much facility that it required that the attention should be particularly directed to the part, to discover any difference in the powers of the two arms.

When the dressings were removed, the ligatures were drawn from the wound, including the intervening portion of artery. The edges of the wound were then brought together by adhesive plaster.

Wednesday, Nov. 13.—Her cough is less troublesome; she swallows liquids with more ease. The only complaint she makes is of a pain in the back, of which she was relieved by a dose of magnesia vitriolata.

Thursday, Nov. 14.—She slept eight hours last night, and her state is in every respect improved; she swallows with less difficulty; the tumor is reducing in size, and is entirely unattended with pain. As I now considered her out of danger, I did not visit her on Friday or Saturday; but Mr. Jones, one of my house-pupils, visited her and found the wound nearly closed.

Sunday, Nov. 17.—I was much disappointed to find her labouring under a high degree of constitutional irritation; the tumor was also increased and very sore upon pressure; the wound was as large as immediately after the operation, and discharged a sanious serum; she complained of a great difficulty in swallowing, and of a most distressing cough after the fits of which she hooped violently; her pulse 96; and her left arm again weaker than the other.

Monday, Nov. 18.—She had passed a restless night; complains of pain in her head, and the size of the tumor has increased; there is great soreness upon the neck, when it is pressed; the pulse is quick, and the tongue is furred.

Tuesday, Nov. 19.—Her pulse is very quick; she had no sleep last night, although she took forty drops of tincture of opium; the tumor is still more increased, and the skin over it of a brownish red colour.

Tuesday, Nov. 20.—She had slept three hours last night; her pulse is 108, and small; she is unable to swallow even her saliva, which constantly dribbles from her mouth, and every attempt at deglutition, produces a violent cough.

Evening.—Her pulse 120; she is in a profuse sweat; and still unable to swallow.

Thursday, Nov. 21.—She died.

DISSECTION.

The aneurismal sac was found inflamed, and around the clot of blood which it contained, there was a considerable quantity of pus.

The inflammation extended on the outside of the sac along the par vagum, nearly to the basis of the skull.

The glottis was almost closed, and the internal surface of the trachea was inflamed, coagulating lymph adhering to its mucous membrane.

The sudden increase which the parts had undergone from inflammation, added to the size of the tumor previous to the operation, had occasioned so much pressure upon the pharynx, that it would not easily admit a bougie of the size of a goose quill.

The nerves, as may be seen, sustained no injury, the ligature having passed between the recurrent and the artery on the one hand, and the par vagum on the other.

The cause of her death then, was the inflammation of the aneurismal sac and the parts adjacent, by which the size of the tumor became increased so as to press on the pharynx and prevent deglutition, and upon the larynx, so as to excite violent fits of coughing, and ultimately impede respiration.

A similar event, however, may be in future prevented, by performing the operation when the tumor is small, and pressure has not been made by it upon important parts, or if it is of considerable size, as in this case, by opening the tumor and discharging the coagulum, as soon as inflammation appears.

As I could not obtain permission to open the head, the cause of the paralysis remains unknown. It did not immediately succeed the operation, but was observed first on the eighth day after it. It came on whilst she laboured under great constitutional irritation, lessened as it decreased, and returned when the irritation became greater; but as it appeared that the irritation which she suffered was owing to the operation being too long deferred, it will not prevent my performing it in any case in which the disease is somewhat less advanced.

It appears that no objection can be made to this operation on account of any unusual danger of bleeding at the time the ligatures separate, since, although they were discharged from the wound on the twelfth day, and they were certainly separated from the artery on the eleventh, the ulcerated extremity of the vessel had been closed by the adhesive process and by a clot of blood which adhered strongly to its coats. Hence we may conclude, therefore, that the carotid artery may be, in this respect, as safely tied as any other artery in the body.

January 29, 1806.

Second case of Carotid Aneurism.

BY ASTLEY COOPER, ESQ. F. R. S. SURGEON TO GUY'S HOSPITAL.

From the Medical and Chirurgical Transactions.

IN the year 1806, I had the honour of presenting to this Society an account of an operation for carotid aneurism, which terminated unsuccessfully.

I then took the liberty of observing, that I thought that the result of that case ought to have no influence in preventing a similar operation under more favourable circumstances, as the death of the patient was attributable to the advanced stage of the disease at the time of the operation. The aneurismal tumor had become so large, as to press upon the air tube and occasion cough, difficulty of breathing, and even effusion of coagulable lymph upon its internal surface; and it had also compressed the pharynx, in a degree to prevent even the passage of fluids into the stomach.

I had no apprehension of the functions of the brain sustaining any permanent injury from a ligature on the carotid artery, having the evidence of Dr. Baillie to prove, that one carotid had been entirely obstructed, and the diameter of the other considerably lessened in the same person, without any apparent ill effects. I have also given a drawing in my former paper, of the left carotid artery being obstructed by the pressure of an aneurism of the aorta; and we have the analogy of animals to show, that both carotids may be tied without any visible effect upon the functions of the nervous system. I had many years ago made the experiment of tying these vessels in the dog, and immediately as it was concluded the animal was placed upon the ground, and showed no diminution of voluntary powers. It exhibited the same fears and affections as before, and betrayed no greater loss of appetite, or disposition to sleep than an animal usually does who has been the subject of an experiment which gives some pain, but does not injure the vital functions. A preparation made from this dog has been long preserved in the collection at St. Thomas's Hospital; and the parts have been injected to show the principal vessels which carry on the circulation, which are the two thyroideal arteries, and tw

branches from each vertebral, passing under the angles of the lower jaw.

I was therefore resolved to take the first opportunity of repeating the operation before the disease had advanced so far as to interrupt, in a considerable degree, any other function than that of the passage of blood through the carotid artery; and my friend Mr. George Young, surgeon, had the kindness to furnish me with a case of the most favourable nature, by sending, first to my house, and afterwards to Guy's Hospital, a man who was in all respects the subject I should have chosen. He had a mind cool and firm, yet obedient to every injunction: a body equally unirritable as his mind—the tumor only about two inches and a half in diameter, and the neck of considerable length, so as to give ample space for exposing the carotid artery. The history of this case is as follows:—

HUMPHREY HUMPHREYS, aged fifty, who has been employed to carry loads of iron* as a porter, observed six or seven months ago, a tumor, having a pulsatory motion, and about the size of a walnut, on the left side of the neck, just under the angle of the jaw, and extending from thence downwards to the thyroid cartilage. It was accompanied with great pain on the left side of the head, which began about five months ago, and was attended with a sense of pulsatory motion in the brain. The tumor affected his speech, so as to make him extremely hoarse; and he had more recently a cough attended with slight difficulty of breathing, and which seemed to be the effect of the pressure of the swelling on the larynx. His appetite was sometimes affected by it; for three or four days he eat heartily, and then for many lost his relish for food. He had a sense of coldness succeeded by heat in his left ear, and he often became sick when eating, but did not vomit. Upon attempting to stoop at any time from that period, he had an insupportable feeling as if his head would burst; a giddiness; loss of sight; and almost total insensibility.

The left eye, which had for some time been gradually closing, appeared now not above half as large as the right; yet its power of vision was equally perfect.

* The employment consists in this:—A collar of wood is placed around the neck and upon the shoulders, and he carries bars of iron on each shoulder, thus protected.

A blister was at this time ordered to be applied on the head by Dr. Hamilton, which lessened his pain. A month ago he applied another with the same relief; but it lasted only for a few days. He continued at work until the day previous to the operation.

The dilatation of the carotid artery was seated just below the angle of the jaw, and about the acute angle which is made by the great division of the common carotid. The tumor was about the size of a pullet's egg, and prominent in its middle.

The pulsation of the aneurism on the day of the operation was remarkably strong; when the sac was emptied by pressure on the artery below, the tumor sprang to its original size with one contraction of the heart.

I proposed to tie the common carotid below the dilated part, and the operation was performed at one o'clock on the twenty-second of June, 1808, at Guy's Hospital.

I began my incision opposite the middle of the thyroid cartilage from the base of the tumor, and extended it to within an inch of the clavicle, on the inner side of the mastoid muscle. On raising the margin of this muscle, the omo-hyoideus could be distinctly seen crossing the sheath of the vessels, and the nervus descendens noni was also exposed. I next separated the mastoid from the omo-hyoideus muscle, and the jugular vein became apparent, which being distended at every expiration spread itself over the artery. Drawing aside the vein, the par vagum was evident, lying between it and the carotid artery, but a little to its outer side. This nerve was easily avoided.

A blunt iron probe constructed for the purpose was then passed under the artery, carrying a double ligature with it. Two ligatures being thus conveyed under the artery the lower was immediately tied. I next detached the artery from the surrounding parts, to the extent of an inch above the lower ligature, and then tied the upper. Lastly, a needle and thread were passed through the artery above one ligature and below the other. The division of the artery was then performed.

Nothing now remained but to dress the patient, and this was done by drawing the parts together, by adhesive straps, the ligatures hanging from each end of the wound, and by laying on a piece of lint retained by straps of adhesive plaster.

Mr. Vose, my dresser, (whose attention to the case was unremitted, and to whose care and knowledge many of my patients have been indebted for their recovery) now asked the patient if he experienced any unusual sensations about his head. He answered, that for the first time since two months after the formation of the tumor, he was relieved from a distressing pain which extended up the left temple, accompanied by a violent throbbing of all the arteries of that side. This pain never returned.

The pulsation in the tumor, however, had not entirely ceased, although it was so much diminished as to become obscure; but it was felt by my colleague, Mr. Forster, by Mr. George Young, Mr. Dubois, jr. from Paris, who accompanied Mr. Young, by Dr. de Souza, and many others who were present at the operation. I concluded it to be the effect of the return of blood by the internal carotid artery from the brain, in consequence of the free anastomosis which exists between the blood vessels within the skull.

The patient was put to bed, with his head elevated, and in this position he felt quite comfortable.

Three p. m. Pulse was moderate, skin cool, suffered very little pain. Pulsation in the tumor perceptible, but inconsiderable, when contrasted with its force before the vessel was tied.

Five p. m. Pulse stronger and fuller, but in other respects as before; head entirely free from pain.

Eight p. m. Patient's pulse reduced to the healthy standard, skin cool; says he feels no pain.

June 23.—*Six a. m.* Patient passed a good night.

One p. m. I saw the patient; he had a slight cough; has had no evacuation since the operation; pulse was not quicker than natural.

Ten p. m. The patient got out of bed, and went to the water-closet, and had an evacuation.

June 24.—*Six a. m.* Pulse natural; pulsation in the tumor continues; tumor sore when compressed; has become firm, for the blood which was fluid in it prior to the operation and all yesterday is now coagulated; pain, and a sense of fulness felt on the right side of the head.

June 25.—*Six a. m.* Patient says he no longer feels pain in any part; has had a good night; has only one troublesome

symptom, viz. an occasional rattling in the larynx from accumulated mucus; pulse this morning quite temperate.

Three p. m. The tumor is considerably diminished; pulse moderate; no constitutional irritation.

June 26.—*Eight a. m.* Patient had a good night; pulse still moderate; skin cool.

Eleven p. m. Still free from any disagreeable symptom.

June 27.—*Seven a. m.* Patient very restless during the night; coughed much and had pain in the head; spirits depressed; pulse natural.

Half past one p. m. Pulse eighty-four; feels much better than in the morning; has had an evacuation from the bowels since last night.

June 28.—*Seven a. m.* Pulse natural; had a tolerable night; bowels open; no pain.

One p. m. I saw the patient; pulse eighty-four; slight pulsation still to be felt in the tumor, which is much diminished.

June 29. Pulse natural; no pain; pulsation still perceptible; tumor so much less that the skin is wrinkled over it.

June 30. Wound dressed the first time, and has united by the first intention as far as the ligatures would permit; he is free from irritation.

July 1. Pulse natural; man tranquil; pulsation very obscure; tumor firm; he is very hoarse.

July 2. No stool; ordered opening medicine; very hoarse, so as to speak only in a loud whisper.

July 3. Pulsation doubtful; man healthy.

July 4. Going on well.

July 5. Wound looks well; man appears natural; but the hoarseness continues.

July 6. He is free from any symptoms of irritation.

July 8. Patient says the tumor is now only half its size at the time of the operation.

July 9. Ordered a poultice.

July 12. Ligatures projecting more; and much more discharge from the wound.

July 14. Upper ligature came away, being removed by Mr. Vose.

July 15. Lower ligature came away; pulsation very obscure.

July 17. Man walked out of his ward; the tumor at this period was reduced to less than half its size. The pulsation in it was with difficulty perceived; but it continued until the beginning of September, at which period all who saw him agreed that the pulsation had ceased, and the tumor was then scarcely apparent. The facial and temporal arteries on the left side cannot be felt.

The wound was a long time in healing, first from a sinus in the course of the ligatures, and afterwards from a fungus where the sinus had been placed.

The man was discharged, cured, on the 14th day of September, and returned to the occupation of a porter at Crawshay's iron wharf, Thames-street.

The result of this case afforded me a degree of pleasure which compensated for the disappointment I felt in the issue of the former. In a professional point of view, it was highly desirable to ascertain the possibility of saving life in a case which had hitherto proved generally fatal; and I could not but feel more than common interest in the fate of a man, who, although he well knew that the trial was new, and the risk considerable, never betrayed the smallest signs of apprehension.

Near eight months have now elapsed since the operation was performed, and he has returned to his former employment without any diminution of his mental or corporeal powers, excepting the lessened action of the temporal and facial arteries on the side in which he was operated. The tumor has disappeared, and he has not been since subject to that pain in the head, by which he had been so much distressed prior to the operation.

This aneurism, from the depth of its situation, was, I believe, seated in the internal carotid artery, and this led me to hope that the regurgitation of the blood, although at first sufficient to produce a slight pulsation in the tumor, would not continue to support its growth, because as the internal carotid passes through a foramen in the skull, a little above the swelling, it could not dilate at that part to bring down any additional quantity of blood into the sac; so that its first effect was likely to be as great as any it could produce. But if the aneurism had been of the external carotid artery, owing to the number of communicating vessels, I should not have been equally san-

guine in my expectation that the pulsation would have ceased, as I have known two instances, one of a wounded radial artery, and the other of aneurism of the anterior tibial, in which the tumor continued to grow by anastomosis, after the arteries had been tied above the swellings.

February 21, 1809.

A case of Exposure to the Vapour of Burning Charcoal.

BY WILLIAM BABINGTON, M. D. F. R. S.
Senior Physician to Guy's Hospital.

From the Medical and Chirurgical Transactions.

A CONSIDERABLE degree of interest having been excited by the melancholy accident which occurred at the Dolphin, a public house, in Honey-lane Market, on the morning of the 24th of November last, I am induced to offer to the consideration of the society the following statement with some reflections on the subject of it.

William Smith, aged thirty-eight, a waiter belonging to the house, and a boy about thirteen years old had, on the preceding night, gone to their bed-room, both in perfect health, and it was supposed under ordinary circumstances. Between six and seven o'clock in the morning, neither of them having been then seen, a person went to the chamber, and on opening the door found the waiter insensible, and apparently at the point of death; the poor lad lying lifeless on the floor, and a chafing-dish containing some extinguished charcoal placed at the foot of the bedstead. The one who still exhibited signs of life was removed into a larger and more airy apartment; and Mr. Hingeston, of Cheapside, being called, and finding that with stertorous breathing the countenance was rather flushed, the lips livid, the pulse full and strong, and as he conjectured, about ninety in the minute, was induced to take away eight, or at most ten ounces of blood from a vein in the left arm. At his request I attended to give what assistance might lie in my power. It was little more than seven o'clock when I reached the house, and having been informed of the circumstances under which these unfortunate persons had been discovered, as

the respiration, pulse, and heat of him who had been removed into a cool and pure air were distinctly perceptible, I thought it my duty to determine, by actual experiment, whether any thing could be done for the recovery of his companion. With this object in view, a common sized silver catheter being passed from the mouth into the trachea, an artificial process of respiration was instituted by the aid of my friend Mr. Hingeston, and that of his assistant Mr. Gingell, alternately breathing into the lungs, and forcing out the air so introduced by means of external pressure.

While these gentlemen were engaged in this process, I went to my friend Mr. Allen, in Plough Court, to request his co-operation in the trial of the galvanic influence, as one of the most ready and satisfactory modes of ascertaining whether any remains of life still existed to encourage our further exertions. In this interval the waiter, whom I had visited as I was quitting the house, had evidently become worse, and the artificial respiration having produced no effect on the boy, we passed several shocks from the galvanic trough, which we had previously found to be acting with considerable power, through his chest and head; but these being equally unproductive of any visible excitement we were reluctantly compelled to think that he had in reality passed from sleep to death. As we now perceived that the vital powers were in Smith still further enfeebled, and that unless more active steps were taken, there was reason to think that he also would fall a victim to the accident, we transferred the galvanic apparatus to his apartment, the window of which being open, and there being no fire, the temperature was necessarily that of the atmosphere, about 50° degrees of Fahrenheit. At this time his pulse, instead of being strong and full, as before the bleeding, was weak and quick, and the respirations very imperfect; but the heat of the upper part of the body remained. The power of voluntary motion was suspended, and the slight convulsive twitchings of the muscles which at first prevailed had altogether ceased; ordinary impressions no longer appeared to affect his organs of sense. His countenance was pale, the eyelids closed, the eyes prominent and rolling in their sockets from side to side; the tongue swollen and projected from the mouth, was locked in this position by a spasmodic action of the muscles which raise the lower jaw. At

the corners of the mouth there was a copious discharge of frothy saliva. Having passed a galvanic shock through the chest, he instantly to our surprise, drew his breath deep. The muscles of the abdomen were seen to react, though feebly, while those of the face were slightly convulsed, and the eyelids were raised. At each successive application of this powerful agent the respirations were more forcibly performed, and the stroke of the artery at the wrist rose in the same proportion. Having, between eight and nine o'clock, procured a bladder filled with oxygen gas, we caused it to be inspired, and we thought that it was followed by an increased activity of the powers of respiration and circulation. As the heat of the body was not deficient, we now sprinkled the face and chest with cold water, which also had the effect of rousing the dormant powers of sensation, as the respiratory muscles were uniformly thrown by it into action, though in a more feeble and interrupted manner than when we employed the galvanic influence. About nine o'clock, having received a large supply of oxygen gas, we repeated the inhalation and the galvanic succussions alternately, through the chest and head, every half hour, till twelve o'clock, when the galvanic application was discontinued, as the heart, though uniformly excited by it, seemed in the intervals to act more feebly, and we were apprehensive that by exalting the action of one power continually, we might destroy that equilibrium of forces which is necessary to the maintenance of life. Some volatile spirit of hartshorn was rubbed upon the temples and chest, and the vapour of it inhaled; the latter rendered him uneasy and excited coughing. As the extremities were cold, bottles filled with hot water were applied to his feet, and the trunk of the body covered with the bed clothes. About one the surface became moist, and gradually a warm perspiration was diffused over the whole body. The pulse from this time was uniformly fuller and more equable in strength and frequency, and as the respirations became more free, the inhalation of the oxygen was repeated at longer intervals, and about four in the afternoon was entirely desisted from. The spasm of the jaw having subsided in a great degree, and the tongue being reduced, he was allowed some very weak wine and water, which he swallowed, a tea spoonful at a time, without any apparent difficulty. The pulse had now risen to 120, and was

strong; we, therefore, in the early part of the evening, considered of the propriety of further venesection; but as the apoplectic stertor was evidently not so great, we determined not to interfere with the efforts of nature; accident, however, accomplished what we had hesitated to do, the ligature having slipped from his arm, he lost, before it was noticed, nearly a pound of blood; the pulse sunk, his countenance collapsed, and Mr. Hingeston, who saw him at this period, was apprehensive that he would not survive the debilitating influence of this accidental hemorrhage. At twelve at night he had, however, recovered from this depression; the pulse was 120, full, but soft. Repeated glysters had procured a copious stool, and fomentations of the belly had been followed by a free discharge of urine. He was now very restless, and Mr. Gingell kindly stayed with a relation of the poor man during the night, when the exertions of both were requisite to keep him from injuring himself, and rolling out of bed. On the 25th, he recovered the use of speech, though very imperfectly. The tongue, when put out, pointed to the left, and the muscles on that side of the face were slightly paralysed, as they had been occasionally observed to be on the preceding day; he complained, when questioned, of pain in his left side; referred to the spot where the wire from the galvanic trough had been applied, and also in his left arm and hand, the latter of which was swelled; the orifice in the arm did not, however, exhibit any signs of inflammation. The cough, which had occasionally distressed him the preceding day, was still rather troublesome. His mental powers seemed much impaired, and he cried bitterly when any person entered the room, a state of imbecility frequently observed in cases of ordinary palsy. He did not recollect one event, or one sensation from the time when on lying down between the hours of eleven and twelve, he saw the charcoal burning bright, till the second or third day after the accident, when he became conscious that he was in a strange room, and felt great distress from being in a situation of which he could form no adequate and satisfactory conception. As the tongue was white, the temperature rather augmented to the touch, and the pulse full, he was kept on a low diet, and the bowels regularly purged. He progressively recovered so far as to be removed by his relations in the course of a few days.

On December 15, he called at my house; at which time he only complained of a slight degree of weakness, more particularly felt in his left arm. His appetite was good. No affection of his head, nor febrile symptoms.

W. BABINGTON.

January 7, 1807.

REFLECTIONS.

THE vapour of burning charcoal has, from times of ancient date, been observed to exert a very deleterious influence on the life of animals; but it is only within these few years that its nature has been developed, and its mode of operating fully appreciated. Modern chemistry has clearly ascertained the composition of atmospheric air, and proved that its capacity for supporting life chiefly depends upon that constituent principle which, in the language of this science, has been denominated oxygen. It has likewise instructed us that there are many other aerial fluids which possess the ordinary physical properties of the atmosphere, but differ essentially from it in not being subservient to the purposes of respiration. They have hence been distinguished from it by the general term of irrespirable airs or gases, and are destructive of life either by the exclusion of what is necessary, or by the presence of principles directly injurious to vital energy. Even the atmosphere that we breathe may, by this very process, as well as by various circumstances of chemical combination, be either itself deteriorated, or it may be impregnated with other fluids, and thus be rendered incapable of supporting the function of respiration. We find that the burning of bodies is one of the most common, but effectual ways of producing this change, which analysis teaches us it does by the abstraction or condensation of the oxygenous portion of atmospheric air, and the evolution of new products corresponding with the nature of the inflammable substance which is made the subject of the experiment.

When charcoal in combustion combines with oxygen we obtain carbonic acid gas, and at the same time in proportion to its moisture, more or less hydrocarbonous gas is evolved. The latter is peculiarly fatal to life, and very much increases the danger resulting from exposure to the vapour of burning fuel. The only attempt ever made to breathe it in its undiluted state

with which we are acquainted, was that by Mr. Davy, who was very nearly killed by three inspirations. Even when mingled with atmospheric air it very powerfully depresses the living energy. The carbonic acid gas, when unmixed, is also very quickly destructive, and from its specific gravity being considerably greater than that of the atmosphere, it is disposed to accumulate in particular situations, and has in such proved a frequent source of death. Rozier and Davy conclude from their experiments, that the carbonic acid in its undiluted form is wholly irrespirable from its exciting a spasmodic action in which the epiglottis is closed, and the entrance of this fluid into the lungs altogether prevented. The effect produced by it therefore is similar to what occurs in the act of drowning; but if this be the case, and the carbonic acid exert no deleterious influence on the nervous and vascular systems, how shall we explain the fact, that the loss of irritability in the muscles of animals which have been destroyed by immersion in noxious airs is comparatively greater than in such as are hanged or drowned? The fatality of this gas to the different classes of animals is in general in proportion to the more complicated system of their organization. On the human constitution according to the period of exposure and the degree of concentration, its effects vary through all the shades of giddiness, pain of the head, anxiety, depression of the powers of life, impeded respiration, loss of voluntary motion and sensation, to the complete suspension of the functions of respiration and circulation. That this pause in the series of vital phenomena shall be final, it is not necessary that any change in the structure of the body shall be observable; we have, however, no right to conclude it such, though appearances should be unfavourable, until our exertions shall have been employed in vain, or that order of combinations which tends to destroy the fabric of organized bodies shall have already commenced. We know not what life is, nor can we without the imputation of temerity speculate on the nature of that mysterious principle which regulates the functions of living beings. While, therefore, there is no apparent læsion of the system, we are called upon to rouse, if possible, its latent energies, by restoring the action of those parts which are more immediately subservient to life; and experience teaches us, that by inflating the lungs we change the condition of the

blood, and that there exists a chain of connexion between the circulation of blood that has undergone the respiratory process, and the maintenance of that state of the organs of sense and motion which fits them for discharging their respective offices.

Before we proceed to consider the plan followed on the occasion which is the more immediate subject of this communication, as the inquiry involves some points of important practical moment, let us endeavour to ascertain what are the appearances which have been remarked in the bodies of animals killed by the vapour of burning fuel. We were refused permission to examine the body of the boy who died; but the researches of others inform us, that there is, in animals furnished with a double heart, a deficiency, either positive or relative, in the quantity of blood contained in the left side of the heart, and in that series of vessels which is connected with it, and an accumulation in the right side of this organ and in its dependent system; and that this condition extends to the veins of the head. In some instances also the ventricles of the brain, it is said, have been observed to contain a frothy serum, occasionally tinged with blood. The lungs have been found collapsed with more or less of frothy liquid in the bronchiæ, and the viscera of the abdomen turgid with blood. Such are the principal anatomical facts: how far do they point out an active and successful mode of proceeding?

The first, and most natural step to be taken, consists in the exposure of the person to a free and pure air, and if the respiration be impeded or suspended we should endeavour to restore this function as speedily as we can, both with a view to the chemical changes to which we have alluded, and to the mechanical effect which the inflation of the lungs has in promoting the circulation of the blood through the minute branches of the pulmonary vessels. It has been insisted upon by very respectable authority, that the abstraction of a small quantity of blood should be the measure first adopted, in order that the heart and the large vessels may, by being relieved from their overdistended state, be enabled to contract, and that the brain also may be freed from pressure. But as there is, previously to the accident, no disposition to this accumulation, and as the condition of the lungs affords a mechanical obstacle to the transmission of the blood, we deem it more advisable to remove this by

causing them to expand, and if the heart should not then freely act, or the symptoms of pressure should continue equally urgent, it will be full time to have recourse to the lancet. In our patient the pulse certainly sunk after the bleeding, if not owing to this operation, and the accidental hemorrhage which occurred in the evening, it was feared by the attendants would have proved fatal to him. In what way, may it also be asked, shall we get rid of that accumulation which occurs in the vessels of the liver and other important organs which occupy the abdominal cavity? The restoration of respiration seems to be the natural and most effectual remedy to the altered balance in the circulating system in general. If, however, the loss of blood be thought necessary, there can be little doubt that opening the jugular vein will most quickly answer the end proposed.

The inhalation of oxygen gas was directed under the idea of there being an accumulation of that carbonaceous matter which, under the ordinary circumstances of respiration is regularly thrown off; and on account of the evident depression of the vital actions produced by the noxious effects of the carbonic and hydrocarbonous gases. As far as we could judge from the state of the pulse it seemed to exert a stimulating influence on the arterial system at least. The propriety of exciting the heart by electricity previous to the establishment of the respiratory process has been questioned by many. On the present occasion we employed the galvanic modification of this principle, and its effect in promoting a deep and complete inspiration, followed by a more vigorous action of the heart and arteries was strongly conspicuous. As the galvanic apparatus is very portable, and admits of easy application, and as the evolution of this principle is not affected by the state of the atmosphere, it seems to be preferable in cases of this kind to the ordinary form of electricity. By diminishing or increasing the number of compartments when we make use of a trough, we can completely regulate the quantity of the power that we employ.

The introduction of fluids into the stomach is not an easy process in many cases of suspended animation, as trismus is by no means an uncommon occurrence. In such instances, however, this is a circumstance of secondary importance.

Portal, and other French writers, strongly recommend the employment of acids.

In Russia where accidents of this description are very common, it is the general practice to rub the body with snow, and it is said with the happiest effect. What may be the state of the animal temperature in this affection is at present merely a matter of conjecture. The skin is for the most part warm, but as yet we have no thermometric observations. The Russian plan is probably of use, from the strong impression which is made upon the skin as a sentient organ. The sprinkling of cold water upon the face and breast is a less energetic application of the same principle, but has considerable effect in rousing persons both from this state and that of syncope. On the present occasion it constantly produced a visible and marked contraction of the respiratory muscles, though inferior in degree to that resulting from the galvanic stimulus. It is also a well known fact, that the recovery of the dogs which are made the subjects of experiment in the Grotto del Cani, is much favoured by their being plunged into a neighbouring lake.

In some cases warmth may be required to be employed, and clysters form an easy mode of effecting this, and at the same time of administering stimulants.

The application of bottles filled with hot water to the feet was the mode followed with Smith, when the apparent depression of the vital powers seemed to demand the aid of artificial heat, and it probably contributed to induce the general and copious perspiration which shortly afterwards broke out.

The torpor of the bowels and urinary organs in Smith were but a part of that general inactivity which arose from the obstructed action of the vital functions, and the directly poisonous influence of the vapour.

It is of advantage in such cases, to apply volatile alkali, or other pungent bodies to the inside ef the nostrils. Whatever promotes sneezing or coughing gives a succussion to the diaphragm, and its antagonist muscles, and tends to reestablish the process of respiration.

Some care will be requisite in the after treatment to guard against any morbid increase of action. The subsequent febrile condition which occurred in our patient was neither severe nor of long continuance.

Whatever plan we adopt, our measures must be promptly and steadily carried into execution; and we may expect that our perseverance will occasionally be put to the test by the interference of some officious person. We were under the necessity of using threats to one of Smith's relations, who would willingly have consigned him to an untimely grave to free him from the misery and pain which she conceived we were cruelly inflicting. Happily, however, our endeavours to restore him succeeded. The exertions made to recover the poor boy, probably proved ineffectual, from the actions of life having been irrevocably suspended by the situation into which he was thrown. In falling out of bed, he was immediately exposed to the concentrated stratum of noxious air which occupied the lower part of the room.

It is to be regretted, that frequently as such accidents have occurred, the danger of sleeping in close rooms in which fires have been kindled, is still not sufficiently understood. From the testimony of the survivor on this melancholy occasion, it does not appear that he or his unfortunate companion were at all aware of the very perilous circumstances in which they placed themselves.

Observations on the Different Methods recommended for Detecting minute portions of Arsenic.

BY JOHN BOSTOCK, M. D.

Read before the Liverpool Medical Society.

THE great importance of being able to detect small quantities of arsenic, in cases where there is reason to suspect that it has been employed with the intention of destroying life, is too obvious to be insisted on. We accordingly find, in most systems of chemistry, that directions are given for the application of those tests which afford the most decisive indications of its presence; and it is generally admitted, that these directions are of such a kind, that where the substance to be examined can be procured in sufficient quantity, and where the operator is sufficiently skilful in his manipulations, the existence of arsenic may be satisfactorily established. It, however,

frequently happens, that the circumstances mentioned above do not exist, but that the substance to be examined is only a minute residue of what had been employed; or that it is to be searched for among the contents of the stomach; or that the person to whose lot it falls to undertake the examination is previously inexperienced in chemical experiments, and unacquainted with the appearances which will be produced by his processes. These considerations have induced me to lay before the society the result of some observations that I have made on the subject. I propose to describe the processes so minutely, that a person who had never before seen them performed, or who was not in the habit of experimenting, might have some idea of the appearances which would be presented to him; and I shall point out what quantities of arsenic we may expect to be able to discover by the application of the different tests.

The latest publications which contain an account of the methods for detecting arsenic, are, Mr. Murray's system of chemistry, and the dictionary of chemistry by the Messrs. Aikins. From these valuable works we learn, that there are five processes that may be employed for this purpose; the precipitation of the arsenic, from any fluid in which it is dissolved, by an alkaline hydro-sulphuret; its precipitation by the sulphate of copper; the reduction of the oxyde into the metallic state, by heating it with extraneous substances in a glass tube; the effect which arsenic has in whitening copper, when heated in contact with it; and the peculiar odour which it exhales when evaporated from a heated surface. I shall make a few observations upon each of these processes, bearing in mind the object which induced me to enter upon the investigation, which is not to give information to the scientific chemist, but to assist those who may be under the necessity of stating an opinion upon subjects of this nature, although not in the habit of performing chemical experiments.

When only a minute quantity of an alkaline hydro-sulphuret is added to a solution of the white oxyde of arsenic, a precipitate is instantly formed of a bright orange colour. One drachm of water, in which ten drops of a strong solution of the sulphuret of potash had been diffused, had four drops of a saturated arsenical solution added; immediately an orange-coloured cream formed itself at the surface of the fluid, which, in the course of twenty-four hours, had nearly subsided,

forming a precipitate of the same colour at the bottom of the glass, and leaving the sides of the vessel slightly coated with a similar substance; the fluid was left transparent. The alkaline hydro-sulphurets are also precipitated by acids, and by other metallic salts, with results more or less resembling that produced by arsenic. To a similar solution of sulphureted hydrogen, one drop of sulphuric acid was added; the whole assumed a light milky appearance, and, after some time, a delicate yellow precipitate rose to the surface of the fluid, and coated the sides of the glass. The same experiment was made with a saturated solution of tartarized antimony; it required a larger quantity of the solution to produce the same effect; but, by the addition of ten drops, the appearances that presented themselves were very similar to those where the arsenical solution had been employed, the precipitate rising to the surface, and assuming a deep orange hue. The same experiment was performed with the nitrate of mercury, but the result was here considerably different; patches of a reddish precipitate were produced, which sunk irregularly; then the whole fluid became opake, and of a dirty brown colour, which was gradually converted to a dull gray. In twenty-four hours there was a copious gray precipitate at the bottom of the glass, while the fluid was left transparent. With the oxygenated muriate of mercury, an irregular copious precipitate was produced, of a dull olive colour, which, after some time, became black, leaving the fluid of a dirty yellow. With the muriate of tin, a copious, dense, brick-coloured precipitate was instantly thrown down, which, in twenty-four hours, was converted into a muddy brown, leaving the fluid transparent. With the nitro-muriate of platina, a copious, clay-coloured precipitate was produced, which, after some time, subsided, and left the fluid transparent, and of a bright reddish-brown hue. Among these precipitates, which are all that are described as being in any degree similar to the hydro-sulphuret of arsenic, the greatest part are so obviously different, as not to afford any probability of mistake: the only two which bear a close resemblance to it are, the hydro-sulphuret of antimony, and the precipitate of sulphur, which is separated from the fluid by the addition of an acid. In this latter case, however, a sufficiently clear distinction is afforded by the colour of the substances,

the sulphur preserving its peculiar light yellow, while the arsenic presents a deep shade of orange. The difficulty of discrimination will only rest between the hydro-sulphurets of antimony and of arsenic; both the colour of the precipitate, and the mode of its formation, are so similar, that when the comparative experiment was made upon the two substances, in contiguous glasses, it was difficult to discover any visible mark of distinction. The arsenic is indeed more easily affected by this process, but this being a difference in the *degree* of the effect, is of no use where we are examining the nature of an unknown compound. Combined with the other processes for detecting arsenic, the effect of sulphurated hydrogen may be of some value, although it seems that it is not sufficiently discriminative to be depended upon alone. It discovers the presence of arsenic with great delicacy; sixty grains of water, to which one grain only of the liquid sulphuret had been added, was almost instantly rendered completely opake by 1-80th of a grain of the white oxyde of arsenic in solution.

The next test of arsenic on which I propose to remark, is the one that was discovered by Scheele; the beautiful green precipitate that is produced by the addition of the sulphate of copper to a mixed solution of the white oxyde of arsenic and potash. The green precipitate formed by this process so decidedly indicates the presence of arsenic, that I thought it desirable to ascertain, as exactly as possible, what were the best proportions in which the ingredients should be employed, and in what way they should be mixed, so as to exhibit the effect in the most obvious manner. After a number of trials, in which the substances were employed in various quantities, and under different circumstances, I am disposed to recommend that the proportions of the oxyde of arsenic, the potash, and the sulphate of copper, should be to each other as the numbers one, three, and five, respectively. For instance, if one grain of arsenic, and three grains of potash, be dissolved in two drachms of water, and, in another equal quantity of water five grains of the sulphate be dissolved, we have two solutions, which are transparent and nearly colourless; but, upon mixing them together, the whole is converted into the most beautiful grass green, from which a copious precipitate of the same hue slowly subsides, leaving the supernatant fluid

nearly without colour. If the same materials are employed in the same manner, but without the arsenic, a delicate sky-blue is formed, which is so decidedly different from the former colour, as not to admit of the possibility of error. The proportion of potash and of arsenic which I have recommended, although different from that pointed out by Scheele, is the one directed by Mr. Murray, and certainly that which I have found to afford the most decisive results. In Aikins' dictionary we are ordered to use "an extremely small quantity" of potash, and we are told that "a yellowish green precipitate" will be produced. From my own experience, I feel myself warranted to advise the addition of the larger quantity stated above, the effect of which will be a green, without any shade of yellow. In order to discover the degree of minuteness to which this test is capable of being carried, 1-40th of a grain of the white oxyde of arsenic was added to sixty grains of water, forming 1-2400 of the weight of the fluid; the proper proportion of potash and the sulphate of copper was added; and, by comparing the effect of these substances with similar quantities of potash and sulphate of copper, without the arsenic, the green was perfectly obvious. In speaking of this method of detecting arsenic, it is necessary to observe, that we must always view the fluid by reflected, and not by transmitted light, and that when we come to minute experiments, they should be examined by daylight. By the light of a candle, it is difficult to distinguish between delicate shades of blue and green, and a weak solution of the sulphate of copper, without any addition, when held between the eye and the window, frequently presents a greenish tinge. Coloured fluids are best seen by placing a sheet of white paper behind the glasses in which they are contained. To those who are not in the habit of performing chemical experiments, it may not be unnecessary to mention, that the correct method of proceeding is to begin by forming solutions of the different materials of a known strength. They are the most convenient for the purposes of calculation, when composed of one part of the solid to ten parts by weight of water, or if more water be required, to some multiple of ten, so that ten grains of the solution, or some higher decimal number, may contain exactly one grain of the substance dissolved.

The third method of detecting arsenic is the reduction of its oxyde into the metallic state, by heating it together with an inflammable body in a glass tube. The directions for performing this experiment are, that we mix the arsenic, or the suspected powder, with black flux or pounded charcoal, and put the mixture into a glass tube closed at one end, and coated with clay and sand, the other end being stopped with a plug of clay. The tube is then to be exposed to a red heat, when the arsenic will be found in the metallic state, encrusting the inside of the tube. The process seems a simple one, and it may be considered as perfectly decisive of the presence of arsenic, when the metallic coating can be observed; but there are some circumstances attending it which make it less generally applicable than might at first view be supposed. To a chemist, with a well furnished laboratory, it may seem to be starting an imaginary objection, to speak of the difficulty which there may be in procuring a glass tube of the proper size, and with a closed end; but such an occurrence may not unfrequently happen to those who are not in the habit of performing experiments; and I may add, that I apprehend few persons will, for the first time, attempt the process, who will not find themselves considerably embarrassed in the execution of it. Some of the difficulty I shall endeavour to remove, by giving a minute account of the different parts of the operation, prefacing my remarks by observing, that here, as well as in other parts of this paper, I do not profess to write for the scientific chemist. The most convenient size of the tube is about 1-4th of an inch, or rather less, in diameter, and about eight inches in length. In order to close the tube, where a blowpipe is not to be procured (which we may suppose will often be the case) the end is to be placed in a common fire, until it is completely softened, and a pair of small tongs being at the same time made red hot, the tube is to be withdrawn from the fire, and the heated end pinched by the tongs, and at the same time bent up at an acute angle, so as to be brought parallel to the body of the tube. The tube is then to be heated a second time, and being again firmly pinched by the hot tongs, the end will be found to be completely impervious. Mr. Murray recommends that the tube be coated with clay and sand. It may be proper to mention, that this part of the process should

not be omitted, and that the best proportions for the coating are, one part of common pipe-clay to three parts of fine sand, which are to be well kneaded together, and reduced to such a state of tenacity, that the lute will readily adhere to the tube, and its different parts will unite without forming a visible seam. The black flux, which is mentioned by Mr. Murray, is often not to be procured, but powdered charcoal answers the same purpose. With respect to the quantity of the inflammable material, I think that considerably less than this author advises is more convenient, for when too much is employed, it requires a greater degree of heat, and a much longer application of it. In Aikins's dictionary we are directed to add "a little powdered charcoal." I believe that the effect will be best produced by using about equal bulks of the arsenic and charcoal. In order to get the materials into the tube, a wooden rammer must be formed, by which they may be pressed down to the closed end. A tube 1-4th of an inch in diameter, coated with a thin covering of clay and sand, requires to be kept at least 1-4th of an hour in a well burnt coal fire, in order to have the full effect produced. This method of detecting arsenic has been esteemed the most decisive, but it is by no means the most minute of the tests; when less than 3-4ths of a grain was employed, I could not say that the metallic coating was clearly perceptible. From a remark that is made by Dr. Black, it would appear, that one grain was the smallest quantity which he thought capable of detection by this process.*

The property which arsenic possesses of uniting with copper, and forming a white compound, is the next method that has been employed to detect the presence of the former substance. To produce the effect, we are directed to place the arsenic, mixed with some carbonaceous matter, between two plates of polished copper, and having bound them together by a wire, to expose them for some time to a red heat, when the part of the copper that is in contact with the arsenic, will be found to have received a permanent white stain. The Messrs. Aikins direct the suspected powder to be mixed with a little charcoal, while Mr. Murray recommends it to be made into a paste with the black flux and oil. I should here, for the same

* Black's Lectures, v. ii. p. 430.

reason as before, prefer the charcoal to the black flux, but I think the oil is certainly a useful addition. When the dry charcoal is employed, the powder is in danger of escaping from between the plates, unless they be very closely pressed together, and when this is the case, a considerable part of it will be found unconsumed after they have been heated. With respect to the proportion of the ingredients to be employed, I have found the process to succeed the best, when to one grain of the arsenic we add about one half grain of powdered charcoal, and about two drops of oil. This property of whitening copper is justly regarded as one of the most decisive tests of the presence of arsenic; but there are some circumstances attending it, which may deserve to be pointed out to the inexperienced. It may be necessary, in the first place, to describe the phenomena that take place when copper is heated according to the process that is described above, but without the addition of the arsenic. Two copper disks, of nearly an inch and a half in diameter, scoured bright with sand, had one grain of powdered charcoal, made into a paste with oil, placed between them; they were bound together with an iron wire, and then kept red hot for ten minutes. When they were withdrawn from the fire, the metal was found to have lost its former appearance, and to have acquired the dull white colour of lead or zinc. The insides of the disks were found to present the same whitish appearance, except on the spot where the charcoal was placed, a small part of which still remained unconsumed. As the disks cooled, the whitish matter which covered them began to separate, and fly off with some force, in the form of small scales, leaving a clean surface of the proper copper colour. In a few minutes, the greatest part of the scales were removed, except on the inside, near where the charcoal had been placed, and here the disks still retained their gray colour. The charcoal was rubbed off, and the surface below it was found smooth and polished; it had acquired a light colour, resembling that of brass, and near the centre there was a small spot, which approached to a steel gray. This appearance still continued, after it had been rubbed with fine sand. The above description of the changes which the disks experience, by being heated with a part of their surface in contact with an inflammable body, will probably impress the society with the same idea,

that, I confess, it gave to myself, that if I had performed this experiment upon a substance which was suspected to contain arsenic, and had not been aware of the appearance that I was to meet with, I should have conceived that I had detected its presence. Upon repeating the process, in precisely a similar manner, except that one grain of arsenic was added to the charcoal, the oxydation of the copper took place as before, and a small part of the charcoal remained unconsumed; but upon rubbing it the white stain was perfectly visible. However, when these disks were compared with those in which the former experiment had been made, the difference between them seemed more in *degree* than in *kind*, so that I should not choose to decide upon the presence of arsenic as indicated by this test, unless the result was more obvious than it must be expected to be, when it exists only in small quantity. It may be proper to observe, that copper whitened in this manner by arsenic, is very subject to tarnish; in three days I could with difficulty distinguish which of the disks had been employed in these two experiments.

With respect to the 5th method that has been pointed out for detecting arsenic, by exposing it to a high temperature, and observing the white smoke and peculiar odour which arise from it in this situation, I shall not think it necessary to make many remarks. It is certainly not much to be depended upon; unless the arsenic is in considerable quantity, the effects are not sufficiently perceptible; and if it be mixed with either an animal or a vegetable substance, the smoke and smell arising from these bodies, when heated, will altogether prevent us from detecting the peculiar properties of the arsenic. When a quantity of arsenic is mixed with an equal weight of flour, and placed upon iron at a low red heat, so as not to cause the flour to inflame, the suffocating smoke that arises from the flour can alone be perceived; nor is it possible to discover that any thing has been mixed with it. With respect to the degree of heat, at which the characteristic odour of arsenic is most readily discovered, by having a bar of iron heated red hot at one end, and becoming gradually cooler towards the other extremity, I thought that the effect was the most perceptible in that part which was just visibly red in bright daylight.

After this review of the different processes for detecting

arsenic, it remains for us to determine on which of them the greatest confidence may be placed. I have no hesitation in giving it as my opinion, that the most convenient, the most delicate, and the most decisive process, is the one in which the green precipitate is formed by the addition of the sulphate of copper. The arsenic may be detected with certainty in a very minute quantity, as well in a fluid as in a solid state; no apparatus is requisite, nor is there any skill required on the part of the operator. When we are called upon, in a judicial investigation, to ascertain whether arsenic has been employed, we are generally obliged to perform our experiments on a small quantity of the substance which may be accidentally left in the cup or bottle, or to search for it among the contents of the stomach. In this latter case, particularly, it is only in minute quantity that we can expect to find it; and in order to separate it from the mass in which it is contained, we must have recourse to the solvent power of hot water.

There are two precautions which I should strongly recommend to every person who may be called upon to search for arsenic in a suspected substance. The first is, that in every experiment which is performed upon the unknown substance, a corresponding one should be made with ingredients of a known composition. If, for example, the test of the sulphate of copper be applied to a suspected fluid, the operator should at the same time add the potash and sulphate of copper to a portion of pure water, and afterwards he should repeat the process with the potash, sulphate of copper, and a given quantity of an arsenical solution. The effect of the reagents will thus become familiar to him both with and without the arsenic, and he will then be enabled, with much more confidence, to state his opinion respecting the fluid under consideration. The second recommendation which I shall beg leave to offer, is, that the examination be never entered upon, until the substances that are intended to be employed as tests, and the necessary apparatus, are all in readiness, and all in a perfect state. In experiments of this kind, there should be *no allowances* made; and as it often happens that the quantity of the matter to be operated upon is small, none of it ought to be wasted upon imperfect trials.

Liverpool, February 10, 1809.

The Croonian Lecture.

BY WILLIAM HYDE WOLLASTON, M. D.

From Philosophical Transactions for 1810. Part I.

I AM aware that the remarks which I have to offer on the present occasion, may be thought to bear too little direct relation to each other for insertion in the same lecture; yet any observation respecting the mode of action of voluntary muscles, and every inquiry into the causes which derange, and into the means of assisting the action of the heart and blood-vessels, must be allowed to promote the design of Dr. Croone, who instituted these annual disquisitions. And it has always appeared to be one great advantage attending the labours of this society, that it favours the production of any original knowledge, however small, in a detached form; and enables a writer to say all that he knows upon a particular subject, without inducing him to aim at the importance of a long dissertation. I shall therefore make no apology for dividing the following lecture into three distinct parts.

In the first of which I shall treat of the duration of voluntary action.

In the second I shall attempt to investigate the origin of sea-sickness, as arising from a simple mechanical cause deranging the circulation of the blood.

In the third, I shall endeavour to explain the advantage derived from riding, and other modes of gestation, in assisting the health under various circumstances, in preference to every species of actual exertion.

PART I. ON THE DURATION OF MUSCULAR ACTION.

The necessity of occasional intermissions from a series of laborious exertions, is within the experience of every one; the fatigue of continuing the effort of any one voluntary muscle without intermission even for a few minutes is also sufficiently known; but there is a third view of the duration of muscular action which appears to have escaped the notice of physiologists. For I believe it has not hitherto been observed that each effort, apparently single, consists in reality of a great number of contractions repeated at extremely short intervals; so short

indeed that the intermediate relaxation cannot be visible, unless prolonged beyond the usual limits by a state of partial or general debility.

I have been led to infer the existence of these alternate motions from a sensation perceptible upon inserting the extremity of the finger into the ear. A sound is then perceived which resembles most nearly that of carriages at a great distance passing rapidly over a pavement.

The rapidity of the motion varies according to the degree of force with which the finger is retained in its place. The sound thus perceived is not at all dependent on the degree of pressure upon the tympanum; for, on the contrary, the vibratory sound is most distinct when that pressure is slight, if the finger be at the same time rendered rigid by the forcible action of antagonist muscles; and when the ear is stopped with great force without the presence of muscular action, no such sound is produced. For instance, if the head be rested upon the hand, in such a position as to press with its whole weight upon the ball of the thumb applied to the ear, no noise is perceived unless the extremity of the thumb be at the same time pressed against the head, or unless the action of some other muscles be communicated to the ear, by any inadvertence in the method of conducting the experiment.

When I endeavoured to estimate the frequency of these vibratory alternations, they appeared to be in general between twenty and thirty in a second; but it is possible that the method I employed may be found defective, and it is to be hoped that my estimate may be corrected, by some means better adapted to the determination of intervals that cannot actually be measured.

It was by imitation alone that I was enabled to judge of their frequency. For this purpose I contrived to render the vibration itself, and the imitative sound, both audible by the same ear.

While my ear rested on the ball of my thumb, my elbow was supported by a board lying horizontally, in which were cut a number of notches of equal size, and about one-eighth of an inch asunder. Then, by rubbing a pencil or other round piece of wood with a regular motion along the notches, I could imitate pretty correctly the tremor produced by the pressure of my thumb against my head; and by marks to indicate the

number of notches passed over in five or ten seconds, observed by my watch, I found repeated observations agree with each other as nearly as could be expected; for I could not depend upon exerting the same degree of force in different trials.

That I might not be deceived by the resemblance of tremors, which coincided only at alternate beats, and therefore might be considered as octaves in music to each other, I sometimes employed notches at greater and sometimes at less distances from each other, but the result was nevertheless the same; and in order to avoid any error that might be caused by some accidental quality of the sound arising from the length of the muscle employed, or length of the bones concerned in conveying the imitative sound to my ear, I made the following variation of the experiment. My ear was stopped by a cushion pressed upon by the end of a notched stick that rested on my foot, and thus conveyed the vibration from the muscles of my leg to the ear, along with the tremor produced by friction upon the notches; and still the results were nearly the same; varying in frequency between twenty and thirty in a second, according to the degree of force exerted in the experiment.*

As a further proof that I was not much deceived in my judgment of the frequency of these vibrations, I requested two or three of my friends to repeat the same experiment for me, and our agreement was such as to confirm me in opinion, that there could be no very considerable error in the estimate.

The greatest frequency that I think I have observed, was about thirty-five or thirty-six in a second, and the least was as low as fourteen or fifteen; but in attempting to lessen the number of vibrations, there appears to be a degree of unsteadiness which prevents any accurate measurement of the real number.

It is very probable, that in cases of great debility the number may be even considerably less, and may be the reason of that

* The resemblance of the muscular vibrations to the sound of carriages at a distance, I apprehend to arise not so much from the quality of the sound, as from an agreement in frequency with an average of the tremors usually produced by the number of stones in the regular pavement of London, passed over by carriages moving quickly.

If the number of vibrations be supposed twenty-four in a second, and the breadth of each stone be about six inches, the rate of a carriage thus estimated would be about eight miles an hour; which agrees with the truth as nearly as the assumptions on which the estimate is founded.

visible unsteadiness, which is known to occur in persons enfeebled by age, or much reduced by disease.

Possibly the foregoing observation may not be altogether new to some members of this society, as it is now about seventeen or eighteen years since it first occurred to me, and I was then accustomed occasionally to mention it in conversation with my friends; but I am not aware that any other person has made the same remark respecting the vibratory nature of muscular action, although I find that Grimaldi had observed the sound that occurs upon stopping the ears, but ascribed, it according to the notions that prevailed in his time, to the hurried motions of the animal spirits.*

PART II. ON SEA-SICKNESS.

The second remark which I have to offer to the society relates to sea-sickness, the cause of which has not hitherto been fully explained; and although the explanation which I am about to propose, may not appear altogether satisfactory to persons who, when at sea, are also rendered giddy by the incessant motion of the waves, and are consequently liable to consider as cause and effect phenomena which in their minds are constantly associated; yet the observation on which it is founded may deserve to be recorded, on account of the degree of relief that may be obtained in that most distressing affection.

After I had been harassed by sea-sickness during a short voyage for some days, and had in vain attempted to account for the difference between the inexperienced passenger, and those around him more accustomed to the motion of the sea, I imperceptibly acquired some power of resisting its effects, and had the good fortune to observe a peculiarity in my mode of respiration, evidently connected with the motion of the vessel, but of which, in my then enfeebled state, I was unable to investigate either the cause or consequence. In waking from a state of very disturbed sleep, I found that my respirations were not taken with the accustomed uniformity, but were interrupted by

* Vera itaque ratio experimenti prædicti est, quia in digito et brachio totoque corpore continuato fiunt multi motus ac tremores, ob spirituum agitationem huc illuc perpetuo accurrentium. *Grimaldi,* Physicomathesis de Lumine, p. 383.

irregular pauses, with an appearance of watching for some favourable opportunity for making the succeeding effort; and it seemed as if the act of inspiration were in some manner to be guided by the tendency of the vessel to pitch with an uneasy motion.

The mode by which I afterwards conceived that this action could primarily affect the system, was by its influence on the motion of the blood; for, at the same instant that the chest is dilated for the reception of air, its vessels become also more open to the reception of the blood, so that the return of blood from the head is more free than at any other period of a complete respiration. On the contrary, by the act of expelling air from the lungs, the ingress of blood is so far obstructed, that, when the surface of the brain is exposed by the trepan, a successive turgescence and subsidence of the brain is seen, in alternate motion with the different states of the chest. It is probably from this cause that, in severe head-aches, a degree of temporary relief is obtained by occasional complete inspirations.

In sea-sickness also the act of inspiration will have some tendency to relieve, if regulated so as to counteract any temporary pressure of blood upon the brain; but the cause of such pressure requires first to be investigated.

All those who have ever suffered from sea-sickness (without being giddy) will agree that the principal uneasiness is felt during the subsidence of the vessel by the sinking of the wave on which it rests. It is during this subsidence that the blood has a tendency to press with unusual force upon the brain.

If a person be supposed standing erect upon deck, it is evident that the brain, which is uppermost, then sustains no pressure from the mere weight of the blood; and that the vessels of the feet and lower parts of the body must contract, with a force sufficient to resist the pressure of a column of blood, of between five and six feet from the head downwards.

If the deck were by any means suddenly and entirely removed, the blood would be no longer supported by its vessels; but both would fall together with the same velocity by the free action of gravity; and the same contraction of the vessels which before supported the weight of the blood would now occasion it to press upon the brain, with a force proportional to its former altitude.

In the same manner, and for the same reason, during a more gradual subsidence of the deck, and partial removal of support, there must be a partial diminution of the pressure of the blood upon its vessels, and consequently a partial reaction upon the brain, which would be directly counteracted by a full inspiration.

The consequence of external motion upon the blood will be best elucidated by what may be seen to occur in a column of mercury similarly circumstanced.

A barometer, when carried out to sea in a calm, rests at the same height at which it would stand on shore; but, when the ship falls by subsidence of the wave, the mercury is seen apparently to rise in the tube that contains it, because a portion of its gravity is then employed in occasioning its descent along with the vessel; and accordingly, if it were confined in a tube closed at the bottom, it would no longer press with its whole weight upon the lower end. In the same manner, and for the same reason, the blood no longer presses downwards with its whole weight, and will be driven upwards, by the elasticity which before was merely sufficient to support it.

The sickness occasioned by swinging is evidently from the same causes as sea-sickness, and that direction of the motion which occasions the most piercing sensation of uneasiness, is conformable to the explanation above given.

It is in descending forwards that this sensation is perceived; for, then the blood has the greatest tendency to move from the feet towards the head, since the line joining them is in the direction of the motion. But when, in the descent backwards, the motion is transverse to the line of the body, it occasions little comparative inconvenience, because the tendency to propel the blood towards the head is then inconsiderable.

The regularity of the motion in swinging, afforded me an apparently favourable opportunity for trying the effect of inspiration; but although the advantage was manifest, I must confess, it did not fully equal the expectations I had formed from my experience at sea. It is possible that the suddenness of the descent may in this case be too great to be fully counteracted by such means; but I am inclined to think that the contents of the intestines are also affected by the same cause as the blood; and if these have any direct disposition to regur-

gitate, this consequence will be in no degree counteracted by the process of respiration.

A friend of mine informed me that he had endeavoured to counteract this mechanical effect upon the stomach, and had experienced immediate relief from a slight degree of sea-sickness, by lying down upon the deck with his head towards the stem of the vessel; by means of which, upon pitching, he was in the attitude of a person descending backwards in a swing.

Whether the stomach be or be not thus primarily affected, or only by sympathy with the brain, the sensation of sinking is in all cases referred directly to the stomach, which is seized with such instantaneous retching, that no person who has not been so situated can form a just conception of it.*

In thus referring the sensations of sea-sickness in so great a degree to the agency of mere mechanical pressure, I feel confirmed by considering the consequence of an opposite motion, which, by too quickly withdrawing blood from the head, occasions a tendency to faint, or that approach to fainting, which amounts to a momentary giddiness, with diminution of muscular power. At a time when I was much fatigued by exercise, I had occasion to run to some distance, and seat myself under a low wall for shelter from a very heavy shower. In rising suddenly from this position I was attacked with such a degree of giddiness, that I involuntarily dropped into my former posture, and was instantaneously relieved, by return of blood to the head, from every sensation of uneasiness.

* There is one occasion upon which a slighter sensation of this kind is perceived, and it appears to indicate the direction of the motion from which it arises, to be downwards. "In a country subject to frequent returns of earthquakes," it is said (Phil. Trans. vol. xliii. p 41.) that "a few minutes before any shock came, many people could foretel it by an alteration in their stomachs; an effect which (it is added) always accompanies the wave-like motion of earthquakes, when it is so weak as to be uncertainly distinguishable." (Michell, Phil. Trans. vol. li. 610.)

It seems that the vapours to which these tremendous concussions are owing, immense in quantity, and of prodigious force, being for a time confined on all sides, elevate the surface of a country to a vast extent, until they either find vent, or meet with some partial cause of condensation; and hence the alternate heaving and subsidence of the ground will produce much the same effects as the rising and falling of the swell at sea.

Since that time, the same affection has frequently occurred to me in slighter degrees, and I have observed, that it has always been under similar circumstances of rising suddenly from an inclined position, after some degree of previous fatigue. Sinking down again immediately removes the giddiness; and then, by rising a second time more gradually, the same sensation is avoided.

PART III. ON THE SALUTARY EFFECTS OF RIDING, AND OTHER MODES OF GESTATION.

In the preceding instances of disturbing the circulation of the blood, by external motion, the effect is disagreeable, and proportionally prejudicial. There may indeed be cases of disorder, in which it will be salutary, but these are probably less frequent than is generally supposed.

In the observations which follow, general opinion will concur with me, on the benefit derived from external or passive motion, and I hope that, in ascribing its good effects to their true cause, I shall enable others to make a valuable distinction, which has not yet been preserved with due care, between one motion which is salutary, and another which is very frequently pernicious. For, although the term *gestation* is employed by medical writers, as a general term comprehending riding on horseback, or in a carriage, and although the merits of such motions, especially the former, were clearly noticed, and perhaps even over-rated, by the discernment of Sydenham, I believe that no explanation has yet been given, of the peculiar advantages of external motion, and am persuaded, that the benefits to be derived from carriage exercise are by no means in so high estimation as they ought to be.

Under the common term *exercise*, active exertion has too frequently been confounded with passive gestation, and fatiguing efforts have consequently been substituted for motions that are agreeable, and even directly invigorating, when duly adapted to the strength of the invalid, and the peculiar nature of his indisposition.

The explanation which I am about to offer of the effects of external motion upon the circulation of the blood, is founded upon a part of the structure observable in the venous system, the mechanical tendency of which cannot be doubted. The

valves which are every where dispersed through those vessels, allow free passage to the blood, when propelled forward by any motion that assists its progress; but they oppose an immediate obstacle to such as have a contrary tendency. The circulation is consequently helped forward by every degree of gentle agitation. The heart is supported, in any laborious effort that may have become necessary, by some obstacle to its exertions; it is assisted in the great work of restoring a system, which has recently struggled with some violent attack: or it is allowed, as it were, to rest from a labour, to which it is unequal, when the powers of life are nearly exhausted by any lingering disorder.

In the relief thus afforded to an organ so essential to life, all other vital functions must necessarily participate; and the various offices of secretion and assimilation, by whatever means they are performed, will not fail to be promoted during such comparative repose from laborious exertion.

Even the powers of the mind itself, though apparently least likely to be influenced by mere mechanical means, are manifestly, and in many persons most immediately, affected by these kinds of motion.

It is not only in cases of absolute deficiency of power to carry on the customary circulation, that the beneficial effects of gestation are felt, but equally so when comparative inability arises from redundancy of matter to be propelled. When from fulness of blood the circulation is obstructed, the whole system labours under a feeling of hurry and agitation, with that sensibility to sudden impressions which is usually termed nervousness. The mind becomes incapable of any deliberate consideration, and is impressed with horrors that have no foundation but in a distempered imagination.

It is in moderate degrees of this species of affection that the advantages of carriage exercise are most sensibly felt. The composed serenity of mind that succeeds to the previous alarm, is described by some persons with a degree of satisfaction that evinces the decided influence of the remedy. With this steadier tone of mind, returns its full power of cool reflection; and if the imagination becomes more alive than usual, its activity is now employed in conceiving scenes that are amusing and agreeable.

As an instance of direct relief to a circulation labouring from mere fulness of blood, I may adduce that of a person, whose friends, as well as himself, were apprehensive, from the violent and visible throbbing of his heart, of the existence of some organic mischief, and were in some measure alarmed for the consequences.

He was persuaded and not reluctantly, to go without delay for medical advice, and was accordingly conveyed in a carriage to the house of some physician of eminence, but did not succeed in finding him at home. As the symptoms did not appear to admit of delay, and were at least not aggravated by the motion, it was hoped that the wished-for advice might be obtained at a part of the town which happened to be at some distance. But the second attempt proved as fruitless as the former, and a third was made with the same event. Since the throbbing had by that time considerably abated, he was contented to postpone any further efforts to the following day, and directed the carriage homewards. By the time that he returned to his friends, he found that the motion of travelling over several miles of pavement had apparently removed the complaint. The pulsation of the heart and arteries had subsided to their natural standard, and he congratulated himself, that his search of a remedy had not been ineffectual, although he had been disappointed as to the source from which he thought he had most reason to expect relief.

If vigour can in any instance be directly given, a man may certainly be said to receive it in the most direct mode, when the important service of impelling forward the circulation of his blood is performed for him by external means. The main spring, or first mover of the system, is thereby, as it were, wound up; and although the several subordinate operations of so complicated a machine cannot be regulated in detail by mere external agency, they must each be performed with greater freedom, in consequence of this general supply of power.

In almost every treatise on the subject of chronical diseases, are to be found numerous instances of the benefit produced by the several modes of gestation which have been most generally adopted; as riding on horseback, in carriages, sea-voyages, and swinging. And in many cases which might be adduced, it has appeared too clear to admit of a doubt, that the cure of the pa-

tient has been owing *solely* to the external agitation of his body, which must be allowed, at least, to have had the effect above explained; that of relieving the heart and arteries from a great part of their exertion in propelling the blood, and *may* therefore have contributed to the cure, by that means only.

The different modes above mentioned are adapted from their nature to different degrees of bodily strength; and if there are cases in which that which appears most eligible may not suit the situation or circumstances of the patient, it cannot be difficult to contrive other means of giving motion, so as least to incommode, and yet to give the greatest relief. A very gentle and long continued, or even incessant motion, may suit some cases better than any more violent and occasional agitation; and in this way, probably, it is, that sea-voyages have sometimes been attended with remarkable advantage.

Hints on the subject of Animal Secretions.

BY EVERARD HOME, ESQ. F. R. S.

Communicated by the Society for the Improvement of Animal Chemistry.*

From Philosophical Transactions for 1809, part II.

THE brilliant discoveries of Mr. Davy on the powers of electricity in producing chemical changes, suggested to me the idea that the animal secretions may be produced by the same means.

* Dr. Wollaston's observations inserted in the Philosophical Magazine, were published after this paper had been laid before the society.

I was led to the present investigation, while preparing my lectures on the Hunterian Museum, in which the secretions in different animals are to be considered. In September last, I engaged Mr. William Brande to assist me in prosecuting the inquiry. In November, I communicated my opinions to Sir Joseph Banks, and stated that I should bring them forward in my lectures; at that time Dr. Young's Syllabus was not published, and Dr. Wollaston's opinions were unknown to me.

Dr. Berzelius, professor of chemistry at Stockholm, published a work on Animal Chemistry, in the year 1806, in the Swedish language, in which he states, in several places, that he believes the secretions in animals to depend upon the nerves, although he is unable to explain how the effect is produced. In proof of his opinion, the following experiment is adduced:

" Trace all the nerves leading to any secretory organ in a living animal,

To prosecute this inquiry with every advantage, requires a knowledge of anatomy, physiology, and chemistry, rarely to be met with in the same person. I have therefore availed myself of the assistance of the different members of this society, the object of which is the improvement of animal chemistry. Their intimate acquaintance with these branches of science renders them peculiarly fitted for such an undertaking.

It is one of the most important subjects to which Mr. Davy's discoveries can be applied, and he has given it the consideration it deserves.

The Voltaic battery is met with in the torpedo and electrical eel; and although it is given only as a means of catching their prey, and defending themselves, and therefore not immediately applicable to the present inquiry, yet it furnishes two important facts: one, that a Voltaic battery can be formed in a living animal; the other, that nerves are essentially necessary for its management; for, in these fish, the nerves connected with the electrical organs exceed those that go to all the other parts of the fish in the proportion of twenty to one. The nerves are made up of an infinite number of small fibres, a structure so different from that of the electric organ, that they are evidently not fitted to form a Voltaic battery of high power: but their structure appears to Mr. Davy to adapt them to receive and preserve a small electrical power.

That the nerves arranged with muscles, so as to form a Voltaic battery, have a power of accumulating and communicating electricity, is proved by the well-known experiment of taking the two hind legs of a vivacious frog, immediately after they are cut off, laying bare the crural nerves, applying one of these to the exposed muscles of the other limb, and then when

and divide them, being careful to injure the blood vessels and the structure of the organ itself, as little as may be: notwithstanding the continued circulation of the blood, the organ will as little secrete its usual fluid, as an eye deprived of its nerve can see, or a muscle whose nerve has been divided can move. We may therefore easily conceive, that any trifling alteration in the nerves of a gland may materially affect its secretion, the supply of blood being in every way perfect."

He says, the agency of the nerves in secretion has generally been disregarded, because our attention is only called to their secret mode of acting, when we discover the insufficiency of all other explanation. Dr. Berzelius's work was shown to me by Mr. Davy while this paper was in the press.

the circle is completed by raising the other crural nerve with a glass rod, and touching the muscle of the limb to which it does not belong, the muscles of both are excited to contractions.

There are several circumstances in the structure of the nerves, and their arrangements in animal bodies, which do not appear at all applicable to the purposes of common sensation, and whose uses have not even been devised. Among these are the plexuses in the branches of the par vagum which go to the lungs, and in the nerves which go to the limbs. The ganglions, which connect the nerves belonging to the viscera with those that supply the voluntary muscles, and the course of the nerves of the viscera which keep up a connexion among themselves in so many different ways.

The organs of secretion are principally made up of arteries and veins; but there is nothing in the different modes in which these vessels ramify, that can in any way account for the changes in the blood, out of which the secretions arise. These organs are also abundantly supplied with nerves.

With a view to determine how far any changes could be produced in the blood by electricity, at all similar to secretion, Mr. W. Brande, who has begun his career in animal chemistry with so much success, made the following experiments, in the suggestion of which Mr. Davy afforded him every assistance.

EXPERIMENT I. Middle of January, 1809.

The conductors from twenty-four four-inch double plates of copper and zinc, charged with a very weak solution of muriatic acid, were immersed in four ounces of blood, immediately on its having been withdrawn from a vein in the arm. The temperature of the blood was kept up at 100° during the experiment. The apparatus was so constructed as to admit of the products at the negative and positive wires being separately collected and examined. When the electrization had been carried on for a quarter of an hour, all action seemed to have ceased. The blood which had surrounded the negative wire was of a deep red colour and extremely alkaline; that surrounding the positive wire was slightly acid, and of a brighter hue.

In this experiment, the coagulation of the blood was not materially affected by the electrical power alluded to.

EXPERIMENT II. 8th of February, 1809.

Finding it necessary to submit perfectly fluid blood to the action of electricity, the following experiment was undertaken with a view of keeping it the longest possible time in that state.

A deer having been pithed, the abdomen was immediately opened into, and a length of about four inches of a large vein in the meso-colon was detached from the neighbouring parts. Two small platina wires, connected in the usual way with forty three-inch double plates, were inserted into this detached portion of vein, and secured by ligatures, having their points at a distance of about one inch from each other. The communication with the battery was kept up for one quarter of an hour; a third ligature was then tied in the centre of the detached vein, in order to cut off the connexion between the positive and negative ends. On removing the portion of the vein included by the ligatures, and containing the conductors, it was found that the gaseous products had forced out nearly the whole of the blood, at the part through which the wires were inserted; alkaline and acid matter were readily detected, but no new product could be discovered.

Finding the coagulation of the blood an insurmountable obstacle to the long-continued electrical action, the serum only was employed in the following experiments.

EXPERIMENT III. 10th of March, 1809.

The conductors from one hundred and twenty four-inch double plates, highly charged, were brought within two inches of each other, in some recent serum of blood, obtained free from the colouring matter, by carefully pouring it off from the coagulum. Coagulated albumen was rapidly separated at the negative pole, and alkaline matter evolved: at the positive pole, a small quantity of albumen was gradually deposited, and litmus paper indicated the presence of acid. These are the effects produced by a high electrical power upon serum.

EXPERIMENT IV. 14th of April, 1809.

Was undertaken to ascertain the effect of a low power: a

battery was employed, consisting of twelve four-inch double plates of copper and iron. In this case, there was at first no appearance of coagulation at either pole; in five minutes, the positive wire became covered with a film of albumen, and in fifteen minutes a filament of about a quarter of an inch in length was seen floating in the fluid, and adhering to the same wire.

EXPERIMENT V. 6th of May, 1809.

Two small platina cups, connected by a large quantity of cotton well washed, and each containing one ounce of serum, were rendered positive and negative, by thirty double three-inch plates very *weakly* charged. The process was continued during twenty-four hours. This power had not been sufficient to produce coagulation at the negative pole. On examining the fluid in the negative cup, it was found to consist principally of an alkaline solution of albumen.

The fluid in the positive cup was rather turbid, it reddened litmus, and was slightly acid to the taste. On standing, it deposited a few flakes of albumen. When evaporated, it afforded saline matter, with excess of acid, (super salts.)

By these experiments it is ascertained, that a low negative power of electricity separates from the serum of the blood an alkaline solution of albumen; that a low positive power separates albumen with acid, and the salts of the blood. That with one degree of power, albumen is separated in a solid form; with a less degree, it is separated in a fluid form.

From these facts, the following queries are proposed:

1st. That such decomposition of the blood by electricity, may be as near an approach to secretion as could be expected to be produced by the artificial means at present in our power.

2d. That a weaker power of electricity, than any that can be readily kept up by art, may be capable of separating from the blood, the different parts of which it is composed, and forming new combinations of the parts so separated.

3d. That the structure of the nerves may fit them to have a low electrical power, which can be employed for that purpose; and as such low powers are not influenced by imperfect conductors, as animal fluids, the nerves will not be robbed of their electricity by the surrounding parts.

4th. That the discovery of an electrical power, which can separate albumen from the blood in a fluid state, and another that separates it in a solid state, may explain the mode in which different animal solids and fluids may be produced, since, according to Mr. Hatchett's experiments, albumen is the principal material of which animal bodies are composed.

5th. That the nerves of the torpedo may not only keep the electric organ under the command of the will, but charge the battery, by secreting the fluid between the plates, that is necessary for its activity.

6th. As albumen becomes visibly coagulated, by the effect produced from twelve four-inch double plates of copper and iron, a power much too low to affect even the most delicate electrometer, may not this be occasionally employed with advantage as a chemical test of electricity, whilst the production of acid and alkali, affected by still inferior degrees of electricity to those required for the coagulation of albumen, may likewise be regarded as auxiliary tests on such occasions?

If these facts and observations appear to the society to throw any light upon the principle of secretion, it may be an advantage to medical science, that they should be laid before the public, as hints for future inquiry.

SELECTED REVIEWS.

Report of the Royal College of Physicians of London on Vaccination; with an Appendix, containing the Opinions of the Royal Colleges of Physicians of Edinburgh and Dublin, and of the Royal Colleges of Surgeons of London, of Dublin, and of Edinburgh. Ordered to be printed, 8th July 1807. pp. 13. Folio.

A Letter, in reply to the Report of the Surgeons of the Vaccine Institution, Edinburgh; with an Appendix, containing a variety of interesting Letters on the Subject of Vaccination, and including a Correspondence with Dr. Duncan, Dr. Lee, and Mr. Bryce: from which also the public will be able to appreciate the Authority of the Surgeons of the Vaccine Institution, and to form a correct opinion of the whole subject. By Thomas Brown, Surgeon, Musselburgh, 8vo. Edinburgh, 1809. *And other publications on Vaccination.*

From the Edinburgh Review for January 1810.

ON a former occasion we entered at considerable length into the merits of Vaccination, and gave a sketch of the acrimonious controversy it had excited in the medical world. Since that time the subject has acquired still greater interest, and has given rise to various legislative projects of no common delicacy and importance. It is very probable, we think, that these will soon be renewed and multiplied; and, in disposing of them we are well aware, that the utmost caution will be requisite; lest on the one hand we prevent the adoption of safe and effectual means, for limiting the ravages of the most loathsome and destructive of our diseases—or, on the other, increase, by precipitate coercion, the evils we wish to avert.

The long list of publications prefixed to this article, and which, after all, is but a small portion of what has lately been written on the subject, will give our readers an idea of the keenness with which the vaccine controversy is still maintained. While the vaccinists have been strengthening their position by parliamentary votes and collegiate reports;—while Mr. Blair has been flogging Mr. Birch, and Mr. Ring has been sounding a peal in the ears of Dr. Mosely,—the nicknames, handbills, squibs, and caricatures of their adversaries, have been too suc-

cessfully employed, where they were calculated to do most mischief—among the weak and the ignorant. This disgraceful warfare, we must however remark, has been almost entirely confined to the metropolis; and, till within these few months, was unknown on this side of the Tweed.

It would be both an irksome and unprofitable task, to attempt to give a regular view of all that has been written for and against cow-pox, since the subject was formerly under our consideration. With a few praiseworthy exceptions, the dispute has been carried on with the same violence and disregard of accuracy, either in observing or in reasoning, which we had formerly so much occasion to reprobate. In truth, vaccination has had to struggle, not only against the indefatigable activity of avowed opponents, but also against the treacherous manœuvres of pretended friends, and the misguided zeal of injudicious partisans. While Dr. Auban recommends vaccination to the followers of Mahomet as a preventive, not only of small-pox, but also of the plague, Dr. Gillum, in the course of his arguments for a *gradual* introduction of cow-pox, seriously expresses his fears to lord Hawkesbury, that by relinquishing small-pox inoculation, we shall have the plague again introduced among ourselves. This sagacious conjecture is assumed as a fact in another lucubration of the same author,—"On the Efficacy of inoculated Small-Pox *in promoting the Population of Great-Britain.*"—"Inoculation," observes this profound and patriotic writer, "has supplied mild small-pox, and consequently saved to the country the multitude of inhabitants "formerly destroyed by the plague. Hence, had inoculation "been known, and seasonably employed, the plague of London "in 1665 might have been prevented, and the lives of 100,000 "of its inhabitants saved, exclusive of their offspring.

"Et nati natorum, et qui nascuntur ab illis."

But, leaving Dr. Gillum to his profound meditations, it is time for us to enter upon the cardinal point of the controversy, which is, whether vaccination be an effectual preventive of small-pox or not. This, it is evident, is entirely a question of fact; and will be more satisfactorily answered, in proportion to the extent and uniformity of our actual experience and observation. In both respects, we do not know almost any disputable point, certainly not one in the whole range of medical sci-

ence, of which the affirmative is as decisively proved. The great majority, we may say all the respectable part of the profession, now concur in considering vaccination as a safe and perfect security against small-pox; in recommending and promoting it in evident opposition to their private interest; and in intrusting to it, in full confidence of its efficacy, not merely the lives of their patients, but of their children and dearest relatives. Those who received the first accounts of it with most scepticism and doubt, are now its firmest patrons and advocates; and, in this instance, the young and the enthusiastic have been ultimately supported by the testimony of the old and experienced. In proof of this, we need only quote the concluding paragraph of the report of the London College of Physicians, who, under the authority of parliament, endeavoured to collect the opinion of the profession at large.

"From the whole of the above considerations, the College of Physicians feel it their duty strongly to recommend the practice of vaccination. They have been led to this conclusion by no preconceived opinion, but by the most unbiassed judgment, formed from an irresistible weight of evidence which has been laid before them. For when the number, the respectability, the disinterestedness, and the extensive experience of its advocates are compared with the feeble and imperfect testimonies of its few opposers; and when it is considered that many, who were once adverse to vaccination, have been convinced by further trials, and are now to be ranked among its warmest supporters, the truth seems to be established as firmly as the nature of such a question admits; so that the College of Physicians conceive, that the public may reasonably look forward, with some degree of hope, to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages, at least, if not to the existence, of the small-pox."

The detailed and valuable report of the Central Society to the minister of the interior of France, is not less satisfactory; nor has any feeling of national rivalry prevented them from owning their obligations to this country for one of the most unexpected and beneficial discoveries ever made in the art of medicine. We could easily quote similar testimonies, in favour of vaccination, from every medical board in Europe. The remo-

test corners of the globe, indeed, have now experienced its efficacy. In every country into which it has been introduced, its progress has been uniform and steady; and no experiment, perhaps, was ever conducted on so extensive a scale, nor any discovery so rapidly disseminated. We have no *data* to estimate correctly the number of individuals of every race, and of every climate, who have been vaccinated; or to ascertain the proportion of favourable cases: but these are not necessary in order to enable us to form a decisive opinion upon the great questions regarding vaccination. A remedy, a mode of practice, or an opinion, may become fashionable in *one* country from adventitious circumstances; but they will not make their way in *all* countries, and under all variety of circumstances. Vaccination, however, has penetrated to the remotest corners of the globe; and, wherever it has been introduced, the increasing experience of every year has only served to confirm the general confidence in its efficacy. It is impossible to explain these facts upon any other principle, than that the advantages derived from it are substantial and permanent. Simple as the practice is, it is attended with some trouble; and nothing but a very firm and general conviction of its utility, could induce the bulk of the population of any country, much less of so many countries, to submit to it.

Nor is the great extent of the practice to be explained, by ascribing it to any undue influence of professional men. Their persuasions might have considerable weight within a certain circle of friends and patients; and imitation might lead a considerable number more to follow their example: but we repeat, that nothing but a conviction of its utility could have induced so large a proportion of the inhabitants of the world to receive and adopt it. Even the patronage it has experienced from medical men of every description, is conclusive in its favour. When first promulgated, it was received with scepticism and distrust; its phenomena were strictly investigated; and its reputed antivariolous powers repeatedly exposed to the severest tests, until all doubts were removed. In Scotland, we know of only *one* medical man who is not satisfied with it, and who does not recommend or practise it; and the same gentleman is the only individual of the profession, in any country, who, as far as we have learned, has abandoned it, after having been satisfied, or

rather, as we shall presently see, pretending to have been satisfied of its efficacy. It must also be remembered, that the general practice of vaccination is injurious to the pecuniary interests of the profession; and therefore, the patronage bestowed upon it by them is a most honourable proof of the candour and disinterestedness of the profession at large. We have heard a great deal of railing about jobs and jobbing; and Mr. Brown has insinuated, "that the motives of its greatest advocates are not more disinterested than those of its greatest enemies." But although it might be granted that a few individuals may have been actuated by the desire of notoriety,—by a sure introduction into practice,—or by the hopes of being appointed to a lucrative office in the vaccine institutions, still, the motives of the great majority of the profession, are evidently above all suspicion. The inoculator cannot expect the same remuneration for performing an apparently easy operation, for the event of which the most timid mother has not a moment's anxiety, as for conducting his patient safely through a painful, loathsome, and dangerous disease. Vaccination has even cut off entirely a very considerable source of the professional emoluments of the physician. Natural small-pox is entirely banished from the higher and middling classes of society; and the cow-pox is too insignificant a complaint to require the consultation of an extraordinary medical attendant. But, although vaccination be adopted and recommended by far the greatest and most respectable part of the profession, still it has been most obstinately opposed by a few individuals, and by means the best calculated to make an impression on the timid and ignorant. We shall now examine the grounds of their opposition, and their pretensions to our notice. They contend that vaccination does not afford sufficient security against small-pox, that it has injurious effects on the constitution; and that it has put an end to inoculation, without serving the same purposes.

The first is the most important objection; not on account of its being better founded than the others, but on account of the nature of the evidence brought in support of it; which consists in a multiplicity of statements, originating in misconception or misrepresentation, and not admitting of a general and permanent refutation. One fact is no sooner explained or contradicted, than another is invented.

The boldest and most determined antivaccinists of the present day, however, will scarcely venture to maintain, as they did once, that cow-pox affords no security whatever. The thousands, and tens of thousands, in every quarter of the world, whom it has enabled to resist variolous contagion,—the total extinction of that pestilence in whole countries, and the security against its importation, which they have experienced from there being no subjects for it to operate upon,—leave no doubt upon the subject. Hence, most of those who originally maintained that opinion, in the most positive and peremptory manner, have now shifted their ground; and contend, that though vaccination must be allowed to impart security *for a time*, this security gradually decays, and is at last exhausted. This hypothetical objection was satisfactorily refuted long ago by Drs. Willan and Stanger. The latter found, by direct experiment, that the insertion of variolous matter into the arms of twenty children, who had been vaccinated in 1801, produced exactly the same effects in 1802 and in 1804. This same opinion, however, has been lately brought forward, with much parade and pretension, by Mr. Thomas Brown, surgeon in Musselburgh, as if it were something new and incontrovertible. The sensation produced by the vaunting advertisements of this gentleman's book in the public papers, induced the managers of the Public Dispensary and Vaccine Institution, to make a strict inquiry into the cases he had referred to; and a report from the surgeons of that useful charity was drawn up and published. Mr. Brown has since replied, both in a pamphlet and in the newspapers; and we shall now proceed to examine his statements and arguments a little more closely, both because they are the most recent and the most detailed that have been laid before the public, and because the reputed facts having taken place in our immediate neighbourhood, are more easily inquired into.

Before we can admit that any instance of unsuccessful vaccination has been established, we must be satisfied of two things: *first*, that the patients were properly vaccinated; and, *secondly*, that they were afterwards affected with the small-pox.

The difficulty of ascertaining the former of these circumstances, is the chief cause of what are called cow-pox failures. "There is little doubt," say the London College, "that some

of the failures are to be imputed to the inexperience of the early vaccinators." And, indeed, when we consider that, from the very nature of the cow-pox, the distinction between a mere local affection, affording no security even for a day, and a perfect constitutional affection, is so small, as to require the utmost attention on the part of the most experienced; that, at the beginning of the practice, all the necessary minutiæ were not thoroughly understood; that from the simplicity and safety of the operation, ladies and clergymen, midwives and farriers, vied with each other in multiplying their inoculations: And when we also consider that the total number of those vaccinated in Great Britain, during the few years which have elapsed since the promulgation of the discovery, is perhaps not less than those variolated since inoculation was first introduced, it is so far from being surprising that some failures have taken place, that we ought rather to wonder that they have been so few. Even now, some practitioners seem to be ignorant of what is necessary to constitute constitutional cow-pox. Of this number we cannot help suspecting, is our Scottish antivaccinist, who, at the same time, displays considerable ignorance of the phenomena of small-pox. "In conformity, then," says he, "both with my own experience of the phenomena of inoculation and vaccination, I contend, that if you have a vesicle, attended with an areola, you may depend upon the production of whatever effects it is capable of." Some of the other antivaccinists go still farther, and represent every puncture by a lancet armed with vaccine virus, whatever effect it produce, or even if it should not produce any effect at all, as a true vaccination, for which the supporters of the practice must be responsible, in case small-pox should supervene.

The testimony of persons entertaining such opinions cannot possibly be admitted, as to the fact of the vaccination having been complete, even when they have had an opportunity of witnessing the progress of the vesicle. The cases, which they state on hearsay evidence, and on the authority of ignorant mothers, of course are still more suspicious; and in truth, there is no tale so improbable, no story so palpably absurd, but, provided it be adverse to vaccination, it is immediately received with open ears and willing hearts, by Drs. Mosely and Squirrel, and Messrs. Birch and Lipscomb. If it militate

against cow-pox, it must be true; and it is needless to investigate it. Mr. Brown, we must do him the justice to say, is honest or hardy enough to confess this.

"It is perhaps proper to notice, that I carefully avoided having any communication with the different practitioners by whom the children were vaccinated, being aware of the strong hold which system has upon the human mind; more especially in this very important subject; thinking it best for the attainment of truth, to state with the greatest possible accuracy, the parents' account of the circumstances that attended the vaccination of their children, notice the appearance of the arm, and give the names of the families, whereby an opportunity is afforded to any of the practitioners to satisfy themselves."

In his reply to the surgeons of the vaccine institution, he betrays still less reserve in maintaining the same doctrine. Some of his statements with regard to certain cases of supposed failure at Haddington, having been contradicted by the medical gentleman who had the care of them, with a civil expression of his regret that Mr. Brown had not applied to him *before* publishing his book, that learned person most valiantly replies—

"Far from regretting that I did not communicate with the medical gentlemen at Haddington, before I mentioned in my book that such cases had occurred there, I have daily reason to congratulate myself on the opinion I had formed of the extensive and alarming effects of system on the human mind; for, had I done so, and afterwards had been regulated by the information I certainly would have received, undoubtedly no such opinions would have been promulgated; and which," says Mr. Brown, "I now find many very respectable characters, both in and out of the profession, consider as entitled to attention and respect."

Such a confession is of itself sufficient to destroy all confidence in Mr. Brown's testimony. It proves a conviction in his own mind, that, had he communicated with *the only persons* who could possibly give satisfactory evidence with regard to these cases, it would have been adverse to his views. In the same spirit, accordingly, we find him bringing forward cases, in which he admits, that "the pustules were so small, and the inflammation so trifling, as to make the practitioner in attend-

ance suspect that he had not undergone the true form of the disease;" and others, in which the inoculator informed the parents, at the time, that the child was *not* properly vaccinated. Nay, he gives the names of respectable practitioners, as having performed that operation to their perfect satisfaction, on patients whom, to their knowledge, they never saw. "The oldest (of two children) was vaccinated by me," says Mr. Brown, "when four months old, in the arm; and the other by *Mr. Keith*, surgeon of the Berwickshire militia in both, about the same age. I recollect perfectly that the vesicle and areola were quite characteristic; and the mother describes, that the areola in both were equal to the size of half a crown; and that Mr. Keith saw the arm in its progress, and expressed himself satisfied of the child having passed through the disease." Now, the whole of this statement turns out to be incorrect; and the most charitable supposition is, that the mother imposed upon Mr. Brown, by saying what she saw was agreeable to him. "So far from having vaccinated the child in question," writes Mr. Keith, in a letter which we are authorised to quote, "I never, to my knowledge, *saw it;* but, on inquiry, find that it was vaccinated by *my hospital serjeant*, at the request of the mother, who supplied the hospital with milk; *the first and only time* of his ever attempting the operation. He saw it *but once* at the distance of eight days after; and at present only recollects, that the vesicle was *smaller* than he had been in the habit of seeing in those vaccinated by me." These examples fully develop the motives of Mr. Brown's conduct in carefully avoiding all communication with the gentlemen by whom these cases were said to be vaccinated; and explain why, in a pretended investigation of truths of such importance, he wilfully shut his eyes, and, when the object he ought to have drawn from nature was before him, chose to copy its reflection from a distorting mirror.

It should also be remembered, that, of those vaccinated gratuitously, either at public institutions, or by individual surgeons, a great number never return to show the progress of the vesicle; and yet, nothing was more common than for these people, in order to excuse their laziness and indifference, to report that the surgeons were well satisfied with the appearances, and had even taken matter from the arm. This, indeed, occurred so frequently, at the Vaccine Institution of Edinburgh, that

the managers were at last obliged to order, that each patient should deposit a pledge, to be forfeited, unless they attend regularly at the stated periods. This has had the best effects; though for a time it diminished the number of applicants.

Another prolific source of alleged failures, is the mistaking chicken-pox, and other eruptive distempers, for small-pox. That such a mistake has often been made, even by practitioners of much experience, cannot be doubted. The diagnosis of regular constitutional small-pox, is indeed abundantly easy; and if we were to refuse that name to every eruption which had not the nosological character, or did not correspond with the best systematic descriptions, we should hear very seldom of small-pox after vaccination. It would be foreign to our present purpose, to inquire into the nature of all the varieties and modifications of which small-pox is said to be susceptible. It is enough for us to prove, that, since the introduction of vaccination, eruptive diseases, of a very different nature, have been confounded with small-pox. Mr. Brown's cases are especially liable to objection on this account, because he has coupled them with a theory which sets all diagnosis at defiance. Mr. Brown contends, in direct contradiction to all analogy and observation, that before his period of security is elapsed, persons who have been vaccinated are liable to be partially affected by the small-pox; that at an early period it produces a slight rash; at a more advanced period, papulæ, which disappear without suppurating; afterwards pustules, which continue a few days; and at length complete small-pox. What opinion is to be formed of the professional knowledge or candour of a man, who records such cases as the following as instances of small-pox after vaccination? "The oldest fell sick on the Wednesday fol-" lowing; and, at the time I saw the other, was confined to " bed, and had been so for two days. He was extremely sick, " and affected with starting, sneezing, and other symptoms of " eruptive fever. When I called, *three days after*, the sickness " was gone, and *no pustular eruption followed.*" p. 192. This is one of Mr. Brown's cases of natural small-pox. His inoculated small-pox is no less singular. Thus, in his twelfth case, " No " *constitutional symptoms* could be detected; a slight heat ap-" peared on the skin, but little or no alteration on the pulse." Next day, " from the report of Mr. M. and the maid, *she had*

"*sneezed repeatedly*, which they attributed to cold; and her "appetite appeared impaired." The day after, "she had "sneezed some the preceding night; only drank tea to break- "fast, but eat no bread." Such statements are truly ridiculous; but we must refer our readers, for an able analysis of the whole series by the surgeons of the Vaccine Institution, to their report.

After such a refutation of Mr. Brown's statements, his hypothesis is scarcely worthy of any notice, in so far as it is founded on observation; and it is obviously contrary to all analogy, although he has attempted to bolster it up, by misstating the most universally received principles of pathological science. It is well known, that two general constitutional diseases cannot exist in the body at the same time. But it is equally well known, that an attack of such a disease, as soon as it is over, leaves the body as susceptible to the impressions of any other as it was before; nay, in many cases renders it much more so; since, in every elementary writer, we find debility from preceding disease enumerated among the causes predisposing the body to receive infection. Mr. Brown, however, has the merit of inventing a very different doctrine. "Indeed, there seems "to be a general principle in the laws of the animal economy, "that after it has been influenced by any power, it is, for some "time, exempted not only from a repetition of its effects, but "also from those of any other cause; and the distance seems "in general to bear a proportion to the severity and ex- "tent of the power previously exerted." In another paragraph, he has still more luminously explained the principle upon which he supposes this exemption to depend. "These cases, "and the whole phenomena and circumstances of vaccination, "show, that there are just grounds for concluding, that a spe- "cific action may exist, *minus* or *negatively*, in the constitu- "tion; that therefore it would be improper, in the event of vac- "cination being found inadequate to maintain its antivariolous "character, to reinoculate those cases which have previously "undergone vaccination, before it was capable of producing a "distinct constitutional effect." We really cannot persuade ourselves to reply to such arguments; but it is not a little singular, that his hypothesis should be directly contradicted by his own experience. Mr. Brown has vaccinated, in all, about

1200; of whom, upon his principles, and upon the supposition that he vaccinated nearly the same number every year while he continued the practice, 400 or 500 have now recovered their original susceptibility of small-pox infection, and 300 are liable to be affected by it in a mitigated form. But, of his alleged cases of failure in his own practice, *eight* only have occurred in the former class, and *ten* in the latter; so that, were we to credit his statements, the antivariolous influence of cow-pox would seem to increase, and to become almost doubled after five years. But it is not by Mr. Brown's experience that we wish any fact or opinion on the subject to rest; we must go to less suspicious authority. Every practitioner is acquainted with the numerous observations recorded in Willan and other writers on the subject. In addition to these, we have real satisfaction in quoting the general result of the experience of the surgeons of the Vaccine Institution at Edinburgh.

"With regard to the facts which have occurred in the practice of the surgeons of the Vaccine Institution, which tend to confirm or refute the doctrine of the mere temporary protection afforded by vaccination against the small-pox, the reporters beg leave to state, that the result of their experience is in strict conformity with that of Dr. Jenner, and the other advocates of vaccination. They have lately inoculated with small-pox, children who were vaccinated eight and nine years ago, and find that they completely resist the disease; they have not been able to produce on any of them more than a local inflammation, which disappeared in four or five days. They have, almost every year, visited numbers of children who were vaccinated during the first years of this institution; and this they have again done within these three months. In this investigation, they have found a great many of those who were vaccinated in the years 1801 and 1802, that is, seven and eight years since, who have been frequently and freely exposed, and especially within these last six months, to the contagion of the natural small-pox, by playing, sleeping, and otherwise mixing with children in all the different stages of that disease, without being infected." p. 32, 33.

The medical attendants of the Foundling Hospital of Dublin have also lately published an account of some very decisive and satisfactory experiments made in that institution, to dis-

prove the hypothesis, that the preventive powers of vaccination diminish in proportion to the distance of time from inoculation. Nine children, who had been vaccinated prior to July 1801, were inoculated with small-pox matter in July 1804, and exposed to the contagion in every possible way; and all of them resisted the infection. These nine children, together with ten others vaccinated between July 1801 and August 1802, were *again* submitted to small-pox inoculation on the 22d December 1809, (i. e. the first class upwards of *eight*, and the second upwards of *seven* years after the vaccination.) "In every in-" stance," says Mr. Creighton the reporter, "the punctures in " the arm of each child, from the third day, inflamed, and con-" tinued until the seventh, when the inflammation gradually " subsided, as certified by Mr. Stewart, (surgeon-general,) and " marked in a table, which, in another publication, will be more " fully expressed;—which circumstance has proved the activity " of the small-pox matter inserted, and which must have af-" fected the constitution, was it in the least susceptible of the " disease. Fourteen days (Jan. 4, 1810) have now elapsed: the " inflammation of the punctures is entirely gone, and never was " attended with the slightest *fever, sickness or eruption.*"

"In corroboration of the above facts," continues Mr. Creighton, "conducted with every degree of accuracy, and " which cannot admit of the smallest doubt on the minds of " those gentlemen who have witnessed them, and hereunto sub-" scribed their names, I can safely assert, that I have submit-" ted *upwards of five hundred infants* and children, vaccinated " by me at this institution, and at the Dispensary for Infant Poor " and Cow-Pox Inoculation, as established in the year 1800, " to a like experiment, and *with the same result in every in-" stance.*"

We ourselves had lately an opportunity of witnessing an equally satisfactory result in regard to the duration of the antivariolous effects of vaccination, from some trials made in a public hospital in this city, in which it was the practice to vaccinate, upon admission, every child which had not previously been vaccinated, or had the small-pox. A boy admitted in 1808, concerning whom no information was received, was erroneously supposed to have been vaccinated, and the operation was not repeated. In the beginning of October 1809, this boy,

although not more exposed to small-pox infection than an hundred other children living under the same roof with him, was seized with natural small-pox and had a very full crop of the distinct kind, which ran their course with perfect regularity. With *virus* taken from this boy on the 5th day of the eruption, seventeen children of the hospital were inoculated, who had all been vaccinated at former periods, varying from five months to *upwards of eight years*. The result of this experiment proved, *first*, that although a considerable degree of swelling and hardness, or even a distinct pustule on the arm with surrounding inflammation, may sometimes be produced by inoculation with variolous *virus*, yet the constitution is incapable of being affected with the small-pox: *secondly*, that these different effects, from a slight hardness to a distinct pustule with surrounding inflammation, are produced from circumstances altogether independent of the period intervening between the time of vaccination and the insertion of variolous virus: and, *lastly*, that the power of cow-pox, in protecting the constitution against the small-pox, is as complete at the end of eight years, as at the end of five months; and that, during *this* period at least, it is to be regarded as a perfect security.

There are even facts on record which prove that the antivariolous powers of cow-pox are permanent, or, at least, that they suffer no diminution in the course of upwards of half a century.

Farmer Jesty, according to the report of the Broad Street Vaccine Institution, visited London in 1805, and "afforded "decisive evidence of his having vaccinated his wife and two "sons in the year 1774, who were thereby rendered unsuscep- "tible of the small-pox, as appears from the exposure of all "the three parties to that disorder frequently, during the "course of *thirty-one* years; and from the inoculation of the "two sons for the small-pox fifteen years ago."

Dr. Jenner has recorded cases of persons who had been casually affected with the cow-pox, and had resisted small-pox upwards of fifty years; and, in a very excellent report of the Medical Faculty in Kiel, upon the cow-pox in the dutchies of Schleswig and Holstein, there is the remarkable case of a woman, then alive, who had the cow-pox when a year and a half old, and had remained secure against small-pox infection for

sixty years. In another case, the protection had then lasted 56, and in many, 40, 30, 20 years.

There is no fact, therefore, we conceive, relating to the animal economy, which can be considered as more decisively proved, than that the antivariolous powers of cow-pox do not decrease or wear out by length of time. At the same time, it must be admitted, that there are some apparently authenticated exceptions to the universality of its antivariolous influence. Within the circle of our own observation, none of these have occurred; and it is a very remarkable thing, that they are confined almost exclusively to the lower orders of society, and to the practice of certain individuals. Mr. Brown admits, and has attempted an explanation of this fact, in which we are desired to believe, that gentlemen, at the head of the profession, never hear of cases of small-pox after cow-pox, because the poor only are exposed to small-pox contagion; and that those who have most practice even amongst the poor, never hear of failures, because the poor never complain when disappointed and deceived, and never seek for assistance even in the most dangerous and loathsome maladies!

Upon the whole, we are satisfied that we concede more than is necessary, when we conclude our observations on the antivariolous powers of cow-pox in the terms of the Collegiate Report. "The security derived from vaccination, if not absolute-" ly perfect, is as nearly so as can perhaps be expected from any " human discovery; for, amongst several hundred thousand ca-" ses, with the results of which the College have been made " acquainted, the number of alleged failures has been surpri-" singly small; so much so, as to form certainly no reasonable " objection to the general adoption of vaccination; for it ap-" pears, that there are not near so many *failures* in a given " number of vaccinated persons, as there are *deaths* in an equal " number of persons inoculated for the small-pox."

The second general objection to cow-pox inoculation, is, that it produces new and unheard of diseases. This, we may observe, was first advanced as a conjecture, prior to all experience, and upon grounds purely hypothetical; though facts have since been referred to by these ill-auguring theorists. These theories, it is scarcely necessary to notice, as we are now in possession of sufficient experience to decide the question.

With regard, however, to the facts which have been referred to by the enemies of vaccination, nothing can be more vague and inconclusive. We have heard all the common cutaneous diseases, which uniformly attend on filth and poverty, attributed to the cow-pox. If in a scrophulous family, any symptom of that disease should appear in a child who had been vaccinated, no matter how long before, still the cow-pox is alone to blame for having engendered foul humours. Nay, if measles, or hoopingcough, or pleurisy, should be unusually fatal, even though the sufferers were never vaccinated, still the cow-pox is the cause of the mortality. Clamorous assertions of this kind, enforced by disgusting caricatures of mangy girls and oxfaced boys, have done more to prevent the universal adoption of vaccination, than any doubts of its efficacy. Of these, the most ridiculous, perhaps, is the frontispiece to a publication "by Fer-"dinand Smyth Stuart, Esq. physician, barrackmaster, and "great grandson to King Charles the Second," in which Dr. Jenner and his coadjutors, *cornuted* and *caudated*, are represented feeding a monster with baskets full of infants; while, to poor Dr. Thornton is assigned the final drudgery of shovelling them into a scavenger's cart, after being duly digested. The following is the poetical description by which this eloquent representation is illustrated.

"A mighty and horrible monster, with the horns of a bull, the hind hoofs of a horse, the jaws of the krakin, the teeth and claws of a tiger, the tail of a cow,—all the evils of Pandora's box in his belly,—plague, pestilence, leprosy, purple blotches, fetid ulcers, and filthy running sores covering his body,—and an atmosphere of accumulated disease, pain and death around him, has made his appearance in the world, and devours mankind—especially poor helpless infants;—not by scores only,—or hundreds, or thousands,—but by hundreds of thousands."

Dr. Mosely, again, has described, in technical style, a whole tribe of new cow-pox diseases; and Mr. Stuart has discovered a brutal degeneration of the human species.

"The cow-pox mange or farcy, cow-pox ulcers, with pus, green—green *as grass*, clearly demonstrating their bovine origin; cow-pox evil or abscess, cow-pox mortification, are nothing in comparison of the brutalization of the noblest work of the creation."—"Among the numerous shocking cases of cow-pox

which I have heard of, I know not if the most horrible of all has yet been published, viz. of a child at Peckham, who, after being inoculated with the cow-pox, had its former natural disposition absolutely changed to the *brutal;* so that it ran upon all fours like a BEAST, bellowing like a cow, and butting with its head like a bull. For my part," he adds with philosophical *scepticism*, " I can scarcely think it possible, having *had no time to ascertain the truth!*"

" O Mosely! thy books, nightly phantasies rousing,
Full oft make me quake for my heart's dearest treasures:
For fancy, in dreams, oft presents them all browsing
On commons, just like little Nebuchadnezzars.
There, nibbling at thistles, stand Jem, Joe and Mary;
On their foreheads, oh horrible! crumpled horns bud:
Here Tom with a tail, and poor William all hairy,
Reclin'd in a corner, are chewing their cud."

The diary of Dr. Barrackmaster Stuart's own child's illness and death, is truly humiliating, and excites a mixed emotion of ridicule and compassion. But as if the powers of language were not sufficient to excite our sympathy with his sufferings, and our indignation at the beastly disease which occasioned them, he has elucidated the history by a very amiable representation of Mrs. Stuart with the baby on her knee, the cradle on one side, and a bason of gruel on the other;—notwithstanding all which, we should have had no doubt that the poor babe's death was owing to scrophula, had it been of less than royal extraction.

But to be serious: The following appears to us to be a satisfactory answer to all this disgraceful clamour. Dr. Bateman, from the records of the Public Dispensary of London, has proved, that the proportion of cutaneous eruptions to all other diseases, was the same before the publication of Dr. Jenner's Inquiry, as in the sixth and seventh year of vaccination. And the Report of the London College states, " The testimonies before " the College of Physicians are very decided in declaring, that " vaccination does less mischief to the constitution, and less " frequently gives rise to other diseases, than the small-pox " either natural or inoculated. The College feel themselves " called upon to state this strongly, because it has been object- " ed to vaccination, that it produces new, unheard-of, and mon- " strous diseases. Of such assertions, *no proofs have been pro-*

" *duced;* and after diligent inquiry, the College believe them to " have been the inventions of designing, or the mistakes of ig- " norant men."

The last important objection which we shall notice, is, that vaccination has put an end to small-pox inoculation, without being so extensively adopted in its stead. In this objection may be traced the motives of many of the keenest opposers of the new practice; and it must be confessed, that its advocates have afforded some pretext for it, by their injudicious and unfounded complaints of want of patronage and encouragement. The truth is, however, that, when all the obstacles which vaccination has had to encounter, are considered, its progress must appear to have been inconceivably rapid. It has been adopted by millions who never would have submitted to variolation. For example, in this very city,* gratuitous inoculation for small-pox had long been offered to the poor at the Public Dispensary, but altogether in vain; while, at the same useful charity, no less than 10,000 have been vaccinated since February 1801. This greater willingness on the part of the poor to inoculate for cow-pox than for small-pox, may be ascribed partly to their conviction of its utility and superior safety, and partly to its not being opposed by the mistaken but very powerful prejudice which prevails among the religious sectaries in this kingdom, that the wilful inoculation of any *disease* is an impious interference with the ordinances of the Almighty; while they do not consider the slight affection produced by vaccination as a disease. But while it has thus become much more general than small-pox inoculation ever was at home, the rapidity of its progress in the most remote corners of the earth, is altogether without example. It has been gratefully received by people of the most opposite races and religions, encouraged by governments of every description, and been the subject of publications in every written language. Manuals of vaccination, in the *Chinese* and *Polish* tongues, are now before us, illustrated with coloured figures. In our own colonies in the East-Indies, its success has been astonishing; and the numbers who have been vaccinated are such, that, in the settlements of Bombay, small-pox is said to be altogether exterminated. The reports of its progress in Ceylon are particularly interesting, on account of

* Edinburgh.

its insular situation so nearly resembling our own. The following is the report made of it by a resident physician.

"The dreadful ravages which the small-pox usually com-
" mitted in Ceylon, previous to the introduction of vaccination,
" must be in the recollection of every one; and it affords me
" infinite pleasure to observe, that, agreeably to the most cer-
" tain information I have been enabled to procure, that destruc-
" tive malady has not existed in any part of the British posses-
" sions on this island during the year 1808, except in the dis-
" trict of Galle, into which it was brought on the 31st of Janu-
" ary by a Maldivian boat, last from Bengal. A large propor-
" tion of the crew of this boat died; and the disease was com-
" municated by a fisherman, who visited it on its first arrival,
" to two or three inhabitants in the neighbourhood of Galle,
" but it spread no further; which must be attributed chiefly to
" the favourable influence of vaccination, which has been so ex-
" tensively diffused in that and the other districts of the island."
Report 1809.

We have a striking proof of the good effects of *general* vaccination. Contagion may be introduced; but it dies for want of susceptible subjects:—a firebrand may be applied; but there is no fuel to produce a conflagration. Even Old Spain was roused from its apathy by the obvious advantages of vaccination; and sent forth an expedition worthy of its better days, which circumnavigated the globe for the sole purpose of carrying to all its vast possessions, and to those of several other nations, the inestimable gift of vaccination: and in point of fact, it succeeded in disseminating it, not only through the boundless colonies of Spain, but through the vast Archipelago of the Visayan islands, and in establishing it wherever it touched in its progress.

So far as our information extends, therefore, we conceive there is no foundation whatever for this objection. Cow-pox, we verily believe, is far more generally resorted to than small-pox ever was; and the public, of course, must have great gain by the substitution.

So much for the objections: but we cannot allow the objecters to escape quite so easily. In a controversy as to matter of fact, where the witnesses contradict each other, it is absolutely necessary to ascertain, as far as possible, their relative credibil-

ity; and to settle our belief by comparing the number and value of opposite experiences. We have already seen, that these are decidedly, and almost infinitely, in favour of the advocates of vaccination. Still, however, the statements of their opponents may have been candid, and their opposition sincere; and the frequent occurrence of adverse facts would have perplexed us, and left doubts upon our minds with regard to the universal safety and efficacy of the practice. Fortunately, however, the conduct of the antivaccinists themselves has set our minds at ease. Their zeal has so far overstepped their prudence, and they have given such evident proofs of want of observation and candour, and have had recourse to such mean tricks and devices to frighten the timid and mislead the ignorant, as to deprive them of all credit with the well informed and judicious. What opinion must be entertained of the fairness or judgment of a man who could affix, on the walls of the most populous streets of London, posting-bills, displaying, in gigantic letters, "*Fatal Effects of Cow-Pox!*" with an earnest recommendation to heads of families to peruse the treatise in which they are stated,—who employs the drivers of errand-carts to distribute them indiscriminately to travellers upon the roads near London,—and could deliberately state, as one of his serious reasons for continuing the small-pox inoculation, that, "in the populous part of the "metropolis, where the abundance of children exceeds the "means of providing food and raiment for them, this pestilen- "tial disease is considered as a merciful provision on the part "of Providence to lessen the burthen of a poor man's fa- "mily!" Another device of the same gentleman, was the publication of a newspaper, for the exclusive purpose of attacking vaccination and its patrons with the lowest and most contemptible abuse.

But the most unjustifiable part of this gentleman's conduct is his wilful falsification of the report of the College of Physicians,—a public record widely distributed under the sanction of parliament. The few passages we have already quoted from it, will enable our readers to judge, whether it be in any respect warrantable to assert, "that the report of the College of Phy- "sicians allows the evidence, produced before the committee "of the House of Commons, to be totally overthrown; that "they allow there is no spurious cow-pox; and that failure, dis-

"order, and death, sometimes occur from some deviation in the "genuine Jennerian cow-pox, which, after a precise period, "fails in its security, and, if it does any thing, produces a new "kind of eruption, tumour, or ulceration."—Mr. Stuart, however, improves upon this hint; and in his address to the British Parliament, thus expresses himself. "*Patres* conscripti! "celebrated and illustrious senators of Britain, lay aside all "prejudice, and receive, I entreat you, the following informa- "tion with candour and attention, viz. That all the physicians, "surgeons and apothecaries, most eminently distinguished "for abilities and professional skill, *all to a man*, now acknow- "ledge, that vaccination is not a certain preventive of the "small-pox; and that it sometimes produces new, dangerous, "and fatal diseases. These *truths* are at this time universally "granted, and candidly acknowledged, by every intelligent "medical gentleman; and this is all I contend for."* Now, in these passages, there can be no misconception or mistake, to be accounted for by ignorance; and, therefore, we are afraid we must set them down as instances of wilful and unpardonable misrepresentation. Misquotation, indeed, seems to be a favourite figure with the antivaccinists; and with none more remarkably, than with their newly-enlisted Scottish auxiliary, who, we may remark by the way, wishes to be considered as the first writer, on that side of the question, entitled to any sort of attention; and treats all his predecessors altogether as cavalierly as his opponents. In proof of this gentleman's extreme looseness, and unfairness of quotation, we might refer to the greater part of his extracts from the public reports, and the writings of

* The reader may take this further specimen of the eloquence and accurate reasoning of this scion of royalty.—"The *Omnipotent* God of *Nature*, the "inconceivable *Creator* of *all existence*, has permitted *Evil*, *Buonaparté*, and "*Vaccination* to exist,—to prosper,—and even triumph for a short space of "time,—perhaps as the scourge and punishment of mankind for their sins, "and for reasons no doubt the best, far beyond the powers of our very cir- "cumscribed and limited portion of penetration and knowledge to discover. "But, are we to worship—to applaud—or even to submit to *Evil*,—to *Buo- "naparté*,—or to *Vaccination*,—because they have for some time been pro- "sperous?—No!—Never let us degrade our honour—our virtue—or our con- "sciences—by such servility:—let us contend against them, with all our ex- "ertions and might;—not doubting but we shall ultimately triumph, in a "cause supported by *truth*, *humanity*, and *virtue*, and which therefore we "well know *Heaven* itself must *approve*."

Dr. Jenner and Mr. Bryce; but we shall content ourselves with one example, in the case of Dr. Willan, whom he ingeniously contrives to quote as an authority for an opinion which he openly disavows, and that by the simple method of stating a sort of caution or exception to his general opinion, as the opinion itself.—" I shall, perhaps, be asked," says Dr. W., " whether I " think that the variolous eruptions, in all the cases adduced " above, were the consequences of imperfect vaccination?" This is the question;—and here is the answer which is immediately subjoined; and of which Mr. Brown, when professing to quote both question and answer, has *omitted* the whole which we have put in italics. " *Vaccine inoculators were, at first, ge-* " *nerally satisfied with any vesicular appearance, surrounded by* " *inflammation; and even now, I believe, many practitioners* " *would consider the specious irregular vesicle, described page* " 39, *as a sufficient guarantee against the small-pox; not being* " *aware how frequently it denotes a temporary incapacity to be* " *affected by either the variolous or vaccine virus. I have had* " *reason, on minute inquiry, to conclude, that, in a very great* " *majority of the cases which occurred near London, the vacci-* " *nation was imperfect.* There is, *however,* great difficulty in " obtaining clear and distinct information on the subject," &c. Willan, p. 73.—Brown, p. 317.

In the same manner, in quoting the admission of the London College, that cases of small-pox have occurred, after apparently perfect vaccination, he takes special care to leave out the word *apparently;* and, at last, makes that learned body admit, that such failures had occurred where there was " sufficient " proof of the most perfect vaccination." Dr. Willan's treatise will also be searched in vain for any thing like the description of chicken-pox, which Mr. Brown has pretended to extract from it. When a person thus ventures to falsify public records to serve a particular purpose, it really is not easy to give implicit credit to statements made on his own authority, in opposition to general experience.

The established efficacy of vaccination as a preventive of small-pox, has given rise to various legislative projects for the utter extermination from this kingdom of that destructive pestilence; and it must be confessed, that our insular situation seems to give some encouragement to such a project.

Even prior to the discovery of vaccination, this had been strongly urged by Dr. Haygarth in this country, Scuderi in Sicily, and a whole tribe of enthusiasts in Germany. Insurmountable difficulties, however, appeared on every side; and nothing was ever attempted. The idea has been again revived, and certainly with greater plausibility, since the antivariolous powers of cow-pox have become known. Still, however, there are very strong, and perhaps insurmountable objections to every thing hitherto devised, or which perhaps may be devised for carrying it into effect. But, before we enter upon the discussion of these, we must notice some opinions of Dr. Adams, physician to the Small-Pox Hospital, and a pretended friend to vaccination; for if his opinion be true, viz. that cow-pox is identical with small-pox, or that they are but varieties of the same disease, it is plain that the diffusion of the one can never lead to the extirpation of the other; since, if there be any foundation for the opinion, that small-pox may be converted into cow-pox, it is impossible not to conclude, that cow-pox will, in many circumstances, degenerate into small-pox. Dr. Adams's arguments for their identity, are derived from the near resemblance of the most favourable kinds of small-pox to cow-pox, and "presumptive proofs deduced from the laws of all other morbid poisons, that the variolous and vaccine *is* the same." And he proceeds positively to state, that by "continuing with great caution to inoculate at the hospital from *pearl* small-pox, (the Doctor's hobbyhorse), we at last succeeded in procuring a succession of virus so nearly resembling the vaccine, that an universal suspicion prevailed among the parents, that they were deceived by the substitution of one for the other." The facts stated by Dr. Adams are certainly curious; but it appears that the practice said to have been followed by him was not necessary for their conversion, as has been satisfactorily proved by Mr. Bryce, (App. p. 70.); and, indeed, the facts and observations stated by that gentleman irresistibly suggest to the mind the mistake committed, at the commencement of the practice of vaccination, in the very same hospital, by Dr. Adams's celebrated predecessor. Dr. Woodville inoculated with variolous virus, when he believed he was using vaccine; and Dr. Adams seems to have reversed the matter.

His presumptive proofs proceed upon a notoriously erroneous assumption, that if a person be inoculated at the same time with the virus of two separate distempers, the one will remain unaltered till the other complete its progress, and will then take as many days to run its course as if it had not been inserted until the progress of the first was complete. The fact is, as stated by Mr. Bryce, "that both punctures will advance regularly, as if only one had been made during the period necessary for the local stage of these infections, and until the constitutional stage from one of them is excited, at which time, and not before, the progress of the other morbid poison, provided its local course be finished, will be arrested, until the first constitutional affection has disappeared." In the same manner, Dr. Adams misstates the fact when he asserts, that "if small-pox and cow-pox are inserted at the same time, in different parts of the same person, we find *no interruption whatever* in the progress of either. Both begin and go through their several courses with the same regularity, as if only one of them had been inserted in two different places." Now, Mr. Bryce's experiments prove incontestably, that as soon as a constitutional affection is produced, by small-pox for example, the further progress of the vaccine affection, if its local course be finished, is arrested until the variolous action has exhausted itself on the constitution; or it is altogether superseded according to circumstances. Dr. Adams is also wrong in his third position, that if a person be vaccinated for example, and in two or three days be inoculated in one place with variolous, and in another with cow-pox matter, the same consequences will follow as if both insertions had been of one matter. For the fact undoubtedly is, that, in such a case, the secondary vaccination will have its progress accelerated, and will arrive at maturity at the same time with the primary vaccination; while the small-pox pustule will *not* be accelerated, but proceed through its local stage in the usual manner. These facts prove, in the most decisive manner, that Dr. Adams's opinion is erroneous, even upon his own principles; and that small-pox and cow-pox are essentially different diseases, not convertible, in any circumstances, into each other.

Of all the plans for exterminating small-pox by means of cow-pox, which we have seen, Mr. Bryce's is the most detail-

ed, and will serve us as a text for the observations we have to offer. This plan embraces three several objects. 1st, To induce parents and others to have all children vaccinated before a certain age; 2d, To get correct lists of all those who have not been vaccinated; and, 3d, To put it in the power, and indeed in the way of all persons, to get the operation performed with skill and safety, by distributing corps of vaccinators up and down the country.

We shall not go into the various details with which Mr. Bryce has endeavoured to explain his project, and to obviate the objections he has anticipated. We shall only observe, with a view to the second branch of his plan, that however desirable such lists might be, we are afraid the procuring of them would be attended with greater difficulties than Mr. Bryce has foreseen. When we consider how inaccurately the registers of births and marriages and the bills of mortality are kept, and how many inconveniences, both personal and political, have arisen from this inaccuracy, we can only express our wishes, that vaccination may furnish a motive, sufficiently powerful, to lead to their simplification and correction; but we must confess, that we have no hopes of seeing any reform in this respect carried into effect. His corps of vaccinators, too, would never be tolerated, either by the public or by the profession; and would, at all events, soon degenerate into a scene of jobbing and intrigue.

It is the first part of Mr. Bryce's plan, however, which requires most attention, and about which there is likely to be the greatest difference of opinion. With regard to the aid which he seems to expect from the private patronage and exertions of men of influence and reputation, there cannot be a doubt, that it is the duty of every such man to instruct and enlighten the public with regard to the advantages to be derived from vaccination; and to remove the prejudices excited against it by those interested in the continuance of variolation. These however have hitherto had but a very inconsiderable effect; and it is well remarked by the College of Physicians,

"The lower orders of society can hardly be induced to adopt precautions against evils which may be at a distance; nor can it be expected from them, if these precautions are attended with expense. Unless, therefore, from the immediate

dread of epidemic small-pox, neither vaccination nor inoculation appear at any time to have been general; and when the cause of terror has passed by, the public have relapsed again into a state of indifference and apathy, and the salutary practice has come to a stand. *It is not easy to suggest a remedy for an evil so deeply imprinted in human nature.*" Bryce, App. p. 37.

It is this apathy or indifference which is the most powerful obstacle to the progress of vaccination; and we have considered its effects as the most serious objection to the practice. Should we, by means of it, succeed in banishing small-pox altogether from this island, or from large districts of it, there is some danger that vaccination would soon be very generally neglected, and that, so large a proportion of the people would be left susceptible of small-pox, that its effects, whenever it should chance to be imported, would be truly calamitous. It is on this account that we have heard very judicious persons dread the partial extinction of the small-pox. They would have it preserved, for the same reason that the clergyman would not have the devil killed, or that insurance offices rejoice in occasional fires. But the possible dangers of exterminating the small-pox are much too visionary to cause us to relax a moment in our efforts for that purpose; and, if we were to succeed in extirpating it in any one country, the danger of importing it would probably be much diminished, by the diminution of its source in other regions, and the encouragement which such an event would hold out to proceed against it with still greater vigour.

Are we, however, to use any other means than mere advice and example? Are we to resort to any measures of compulsion or restraint? Are we to have recourse to legislative measures? These are great political questions, in regard to which the present and late rulers of the state have expressed very different opinions; Mr. Perceval conceiving that more evil than good would result from any measure of coercion; and Lord H. Petty taking a different, and, we are inclined to think, a more correct view of the subject.

" Though I would not interfere," said his lordship, " with the freedom of an individual with regard to the mode of preserving his own health, yet I have no difficulty in saying that no individual has a right to conduct himself, even in the pursuit of preserving his own health according to the best of his judg-

ment, so as to endanger the health of a great portion of the community by spreading an infection, which is the case when individuals go abroad while they are under the process of inoculation under the old mode. This practice I understand to be increasing, and may be attended with dangerous effects. I know that in a country like this, where the inhabitants have been so accustomed to liberty in almost every thing, and in this practice among the rest, it must be difficult, and, without some infringement of liberty, perhaps impossible, to put an end altogether to this inconvenience. This, I am afraid, can hardly be done without some sort of compulsion;—and that is odious to the people of this country. But although compulsion be odious, while it calls on mankind to be active against their will, yet while it goes no farther than to forbid their doing that which is hurtful to others, I think that a state has, not only a right, but that it is its duty to enforce it. I would therefore say, that if persons will persist in following the old system of inoculation, they should be compelled to confine their practice within their own houses, and shall not be allowed to spread these ravages and this pest over the community at large." Debates, p. 74, 75.

The professional arguments for the restriction of small-pox inoculation are indeed very strong. Every person variolated becomes a centre of contagion, spreading disease and death around him. In addition to this obvious fact, and the instances quoted in various publications, we may state what took place in Weimar, both on account of its authenticity, and because, from its date, it cannot be suspected of exaggeration or colouring. The small-pox had not been seen in that city for about five years, when it became prevalent in the neighbouring villages. The duke, anxious for the safety of his children, wished to protect them by inoculation, but did not think himself entitled to take a step, however interesting to himself, which might endanger the lives of his subjects, without strongly warning them by advertisement, and inviting them to follow his example. Notwithstanding these laudable and truly paternal precautions, an epidemic was the consequence, which was distinctly traced to the ducal residence, and proved fatal to above fifty individuals in that small city. Even prior to the discovery of vaccination, in many countries small-pox inoculation was not per-

mitted except during the prevalence of an epidemic. But if such a restriction was at all tolerable then, it is urely much more so now, when it is in the power of every person to protect himself, and those under his care, without endangering the safety of others.

Mr. Highmore and Dr. Adams, *both of the Small-pox Hospital*, have argued in favour of small-pox inoculation on very absurd and untenable grounds. Dr. Highmore, for instance, is afraid, that if variolation be prevented, we shall not be able to test our vaccinated patients; and that the progress of vaccination will be impeded, if it be encouraged, as 'the flower which is forced into a too early maturity has neither strength nor fragrance comparable with that which blooms by fair and regular cultivation.' Dr. Adams' arguments are still more insidious, and equally futile. This gentleman apologizes to the public, for having so long delayed to offer, in print, his opinion on a subject so immediately connected with his engagements, and on which the public, he conceives, had a right to demand the result of his inquiries. But he was afraid of having his motives impeached; and there was a difficulty of finding any thing to oppose. At last, the letter to Mr. Perceval, in which Sir Edmund Carrington, late chief justice of Ceylon, shows, from our statute books, the legality of restraining every infectious disease, even small-pox, appeared to the physician of the small-pox hospital worthy of refutation; and a most singular attempt at refutation he has produced. As, on a former occasion, under the mask of a popular inquiry into vaccination, he had endeavoured to palm his *pearl-pock* upon the credulity of the people; so now, he endeavours to obscure the question relative to restricting inoculation, under the pretence of a general inquiry into the laws of epidemics. 'To 'defend small-pox inoculation,' says he, 'is only to repeat all 'that was said fifty years ago, and has been repeated ever 'since, till the last ten years. To admit that vaccination is a 'most important improvement, is equally superfluous. To say 'that this second improvement ought not by force to supersede 'the first, would only lead to those arguments by which small-'pox inoculation was first defended; and to answer clamour 'and invective, requires a mind organized like those who use 'them.' To this we can only answer, that the case is totally altered within these ten years. Till then, we had only a choice

of evils, and we were not restricted in the only means offered to us of defending ourselves, lest in so doing we should injure our neighbours. But now that we possess a means of defence, equally useful to ourselves, and perfectly harmless to all around us, we are no longer entitled, either by reason or justice, to have recourse to the former. When Dr. Adams talks of a law restricting variolation, operating against the conscientious, without restraining the unprincipled or unfeeling, we must confess that we do not understand him. That none but the unfeeling would now have recourse to variolation, we might perhaps be disposed to allow; but that any such restriction would operate *against* the conscientious, so long as they have vaccination in their power, is what we will not admit. The great difficulty is, to prevail upon the mass of the people to use *any* preventive. With those, who have sufficient judgment to have recourse to one, the transition to a better is easy and natural. This was strongly exemplified in a fishing village in this vicinity. The first person in Newhaven, who had the courage and prudence to have his children inoculated with small-pox, was obliged to fly, as a monster, from the fury of his ignorant neighbours; and yet it was in that very village that vaccination first became general in Scotland,—and in that very man's family was it begun. Dr. Adams's whole chapter upon the recent plans for exterminating small-pox, is one of the most extraordinary pieces of reasoning we ever met with. We cannot exterminate small-pox, it seems, because constant and indestructible sources of contagion may be bought from every old-clothesman in Monmouth-street, and may be dug up in every grave! While these exist, the restriction of inoculation will not narrow its operations! We must not attempt to exterminate small-pox, because we do not know how to exterminate measles and scarlet fever; and because our ancestors never attempted any thing of the kind! And, lastly, restricting small-pox inoculation, and even forbidding the inoculation of outpatients at the hospitals, is compelling vaccination!

'The discovery of vaccination is certainly a most invaluable 'acquisition; and those who are satisfied with it, do right to 'recommend it to the world. Happy for themselves and others, 'if they had been contented to recommend it by their example, 'and by the facility which the practice itself offers. If they go 'further than this, there is only one step more they can con-

mitted except during the prevalence of an epidemic. But if such a restriction was at all tolerable then, it is urely much more so now, when it is in the power of every person to protect himself, and those under his care, without endangering the safety of others.

Mr. Highmore and Dr. Adams, *both of the Small-pox Hospital*, have argued in favour of small-pox inoculation on very absurd and untenable grounds. Dr. Highmore, for instance, is afraid, that if variolation be prevented, we shall not be able to test our vaccinated patients; and that the progress of vaccination will be impeded, if it be encouraged, as 'the flower which is forced into a too early maturity has neither strength nor fragrance comparable with that which blooms by fair and regular cultivation.' Dr. Adams' arguments are still more insidious, and equally futile. This gentleman apologizes to the public, for having so long delayed to offer, in print, his opinion on a subject so immediately connected with his engagements, and on which the public, he conceives, had a right to demand the result of his inquiries. But he was afraid of having his motives impeached; and there was a difficulty of finding any thing to oppose. At last, the letter to Mr. Perceval, in which Sir Edmund Carrington, late chief justice of Ceylon, shows, from our statute books, the legality of restraining every infectious disease, even small-pox, appeared to the physician of the small-pox hospital worthy of refutation; and a most singular attempt at refutation he has produced. As, on a former occasion, under the mask of a popular inquiry into vaccination, he had endeavoured to palm his *pearl-pock* upon the credulity of the people; so now, he endeavours to obscure the question relative to restricting inoculation, under the pretence of a general inquiry into the laws of epidemics. 'To 'defend small-pox inoculation,' says he, 'is only to repeat all 'that was said fifty years ago, and has been repeated ever 'since, till the last ten years. To admit that vaccination is a 'most important improvement, is equally superfluous. To say 'that this second improvement ought not by force to supersede 'the first, would only lead to those arguments by which small-'pox inoculation was first defended; and to answer clamour 'and invective, requires a mind organized like those who use 'them.' To this we can only answer, that the case is totally altered within these ten years. Till then, we had only a choice

of evils, and we were not restricted in the only means offered to us of defending ourselves, lest in so doing we should injure our neighbours. But now that we possess a means of defence, equally useful to ourselves, and perfectly harmless to all around us, we are no longer entitled, either by reason or justice, to have recourse to the former. When Dr. Adams talks of a law restricting variolation, operating against the conscientious, without restraining the unprincipled or unfeeling, we must confess that we do not understand him. That none but the unfeeling would now have recourse to variolation, we might perhaps be disposed to allow; but that any such restriction would operate *against* the conscientious, so long as they have vaccination in their power, is what we will not admit. The great difficulty is, to prevail upon the mass of the people to use *any* preventive. With those, who have sufficient judgment to have recourse to one, the transition to a better is easy and natural. This was strongly exemplified in a fishing village in this vicinity. The first person in Newhaven, who had the courage and prudence to have his children inoculated with small-pox, was obliged to fly, as a monster, from the fury of his ignorant neighbours; and yet it was in that very village that vaccination first became general in Scotland,—and in that very man's family was it begun. Dr. Adams's whole chapter upon the recent plans for exterminating small-pox, is one of the most extraordinary pieces of reasoning we ever met with. We cannot exterminate small-pox, it seems, because constant and indestructible sources of contagion may be bought from every old-clothesman in Monmouth-street, and may be dug up in every grave! While these exist, the restriction of inoculation will not narrow its operations! We must not attempt to exterminate small-pox, because we do not know how to exterminate measles and scarlet fever; and because our ancestors never attempted any thing of the kind! And, lastly, restricting small-pox inoculation, and even forbidding the inoculation of outpatients at the hospitals, is compelling vaccination!

'The discovery of vaccination is certainly a most invaluable 'acquisition; and those who are satisfied with it, do right to 'recommend it to the world. Happy for themselves and others, 'if they had been contented to recommend it by their example, 'and by the facility which the practice itself offers. If they go 'further than this, there is only one step more they can con-

'scientiouslv take, that is, the forcing vaccination on *all*, under 'certain penalties. I know there are many men, whose inten- 'tions are perfect purity and benevolence, and who would 'start at such an imputation; but what else are we doing in 'prohibiting inoculation of small-pox, or even in refusing it to 'those who are unable to make a pecuniary return, or tempo- 'rary seclusion? If they do not submit to vaccination, are they 'not without the chance of escaping six years, at most, many 'of them less than a month in the metropolis? Of escaping 'what? A disease which is said to destroy one sixth of the 'sufferers, besides maiming, blinding, and disfiguring many 'more. Do we know of any penalty heavier than an almost 'double decimation, and these additional torments?'

How far it would be prudent to forbid small-pox inoculation altogether, may admit of some doubt; but that the managers of the Small-pox Hospital acted rightly when they, at last, prohibited Dr. Adams from converting it into a source of pestilence, we conceive to be undeniably established by the statement made, without contradiction, in the house of commons, with regard to the effect of inoculating outpatients.

'There is,' said Mr. S. Bourne, 'a very laudable institution 'in this country established for the inoculation of the small-pox. 'I understand it is the practice now to inoculate outpatients 'there, to the amount of 2000 a year; and that it is usual for 'these outpatients to resort twice a week to be inspected at this 'hospital by the surgeon. Now, it must be quite obvious, that 'this is a practice of the most dangerous nature; and that if 'we were to prescribe a mode of spreading the contagion, it 'would be difficult for human ingenuity to devise any thing 'better adapted for that purpose. No one would be more un- 'willing than myself to compel individuals to adopt any par- 'ticular mode for the preservation of their health, because it 'is not in itself a proper subject of compulsion; but still I 'must say, that however reluctant I may be to use any restraint 'upon such a subject, some means should be taken to prevent 'the dissemination of this contagious malady. I think that the 'legislature would be as much justified in taking measures to 'prevent this evil, by restraint, as a man would be in snatching 'a firebrand out of the hands of a maniac, just as he was going 'to set fire to a city.' Debates, p. 79.

The Pathology of the Membrane of the Larynx and Bronchia.

BY J. CHEYNE, M. D.

Edinburgh, 1809, 8vo. pp. 204.

From the Edinburgh Medical and Surgical Journal for the year 1809.

IN this volume we are presented with a republication of the author's former essay on croup, improved in its arrangement, and enlarged by some new and important observations; with cases of bronchial polypus, and of thickening and ulceration of the membrane of the larynx; and with observations on the epidemic peripneumony of children, and on peripneumonia notha.

Having with great precision described the ordinary form of the croupy paroxysm, Dr. Cheyne observes, that in the progress of the disease there are some remarkable changes, which may escape the notice of a hasty observer. These changes, however, distinguish the different stages of croup, and the degrees of danger to be apprehended.

" 1st, There is the ringing croupy cough, (to which many children are liable upon taking cold, more particularly those who have had an attack of croup,) attended with little or no change in the breathing, or the sound of the voice.

" 2d, The unusual shrill croupy cough, with difficult breathing; the necessary supply of air is with difficulty inspired from the construction of the passage. The voice is altered, broken, both hoarse and puling. The difficult breathing in croup has been compared to the sound of air passing through thick muslin; it rather appears like the sound of a piston forced up a dry pump. This difficult breathing varies very considerably according to the degree of stricture. It is either like the sound to which I have likened it, dry and hissing, audible in different degrees; or when the swelling and spasm of the larynx is greater, it is crowing, and sometimes creaking and suffocative. Under this extremity of difficult breathing, children are said to have perished. Any person by voluntarily contracting less

or more the larynx may imitate every degree of the different breathing.

" 3d, The cough and voice are stridulous; the respiration is difficult, laborious, creaking, sometimes suffocative, varying in the degree of difficulty and laboriousness.

" 4th, The voice is whispering and low, the cough less frequent, and not audible at the opposite side of the room. There is the act of coughing without the sound; the respiration increasing in difficulty and quickness, laborious and interrupted."

This account of the varieties of the state of the voice, breathing and cough, which take place in the progress of croup, is no less just than precise, and when connected with the very intelligent observations made by our author on these states, becomes highly important.

" 1st, Is a state which is rather the forerunner of an alarming attack of croup. It is often without danger. It points out the children who, when exposed to the usual excitements, are most liable to croup. It would seem sometimes to be sympathetic.

" 2d, When with the croupy cough the breathing continues difficult, the serious attack has commenced, and the child is in danger. From this state, it is true, I have known the child immediately recover, even when medicines of little activity were given; but generally, if no effort is made to save him, he will soon get beyond the reach of medicine. In this state, the child's skin is warm, his tongue is white, his pulse full and quick, and his countenance is much flushed; but it is still the flush of heat and fatigue. The usual mucous secretion is interrupted, he is timid and apprehensive, and, when advanced beyond infancy, he is willing to submit to any measures which may be thought necessary for his relief. His eye is heavy, watery, and bloodshot. In this state, the degree of danger is to be learnt from the state of the breathing.

" 3d, This state shows the existence of the second stage of croup, that of effusion. Every person accustomed to the disease, knows how hopeless it generally is. The countenance is still flushed; but, in the flushing, we discover evidence of defective circulation. The lungs no longer purify the blood. There is a purple redness in the cheeks, eyes, and nails. The complexion is often mottled, or the flush on the cheeks is

circumscribed. The pulse is smaller, and very quick. There is sometimes an expectoration of mucus mixed with flakes of puriform matter. There is a sediment in the urine. The eyes are prominent and bloodshot; the pupil is dilated, and the iris has appeared to me pale. There is jactitation when the breathing is most violent, and lethargy when it is less so. During this stage, it is not unusual to find the child breathing with the least uneasiness, in postures which might be thought unfavourable to respiration.

"4th, This is the moribund state. The trachea is coated with effusion. The blood appears broken in the veins. The face is leaden, and the eye filmy. The extremities are cold and swollen. The muscular power is exhausted, and the child nearly insensible.

"In the first stage, the breathing is difficult; in the second it is both difficult and laborious. In the first stage, the affection of the breathing appears chiefly to arise from the state of the wind-pipe; in the second, as much, and perhaps more, from a disease of the whole pulmonary system. There is both heaving of the diaphragm and abdominal muscles, and a remarkable pulling down of the cartilages of the larynx at every inspiration."

In the next section, entitled, "an attempt to explain the pathology of croup;" having observed, that croup is the disease of infancy and youth, rarely if ever occurring after the age of puberty; that the larynx, before the occurrence of puberty, is but imperfectly developed, and the voice, therefore, weak and feminine; that, in a case of premature puberty the voice was grave and manly, while on the contrary, the voice of castrati never attains perfection, nor the larynx its full growth; the author concludes, that the predisposition to croup is connected with these peculiarities, and that the constitution becomes in a great measure secured from croup by the increase and vigour which the larynx and bronchial tubes acquire at puberty; or, that debility of the trachea is the predisposing cause of croup, and, that the greater degree of tone with which the trachea after puberty is endowed, enables it, in a great measure, to resist those excitements which would have operated on a less perfect organ.

That croup occurs as frequently in adults as in children,

with this difference, that adults possess the power of expectorating the lymphatic exudation before it becomes a solid membrane, as Michaelis and some others have supposed, Dr. Cheyne ventures to deny, on the following grounds.

"1st, In a disease chiefly of adults, in which also a membrane is found, the membrane is not expectorated until it acquires a density much greater than that of croup.

"2d, In the very rare cases of croup in adults, the power of expectoration does not appear greater than in children. By dissection it is proved insufficient to expel the membrane.

"3d, Inferring, from the effects of common catarrh in changing the sound of the voice at all the stages of life, the cough which exists before the membrane is formed should be equally characteristic of a diseased state of the organ in adults as in children.

"4th, In adults, in cases of diseased larynx, when the membrane of the trachea is coated with exudation, there are symptoms corresponding to those of croup in children. The voice is stridulous and whispering, and the cough suffocative, and the expectoration is exceedingly difficult."

Inflammation of the mucous membrane of the larynx and trachea, consequent spasm of the muscles, exudation of lymph, formation of membrane, with altered mucous secretion, preventing the purification of the blood, producing sensorial debility, and finally suffocation and death, make up the pathology of the disease. In croup there is increased action, effusion, laborious respiration, circulation of blood, with venous colour, sensorial debility, and death. "This," says our author, "is the course of the disease."

In treating of the diagnosis, it appears to us, that Dr. Cheyne is either too nice and fastidious, or that he is establishing distinctions without differences. If the cough, voice, and mode of breathing be those of croup, and if a membrane be actually found on dissection after death, although sloughs may have been observed on the uvula and tonsils, or although the paroxysm may have supervened to, or been complicated with scarlatina, with measles, or with small-pox, still it is croup, not indeed pure and idiopathic, but, though complicated, still croup, still inflammation of the membrane of the larynx and trachea, exudation, and formation of membrane, giving occa-

sion to the same series of symptoms, which distinguish idiopathic croup. Yet, says our author, "*whatever be the symptoms*, when the fauces are sloughy, I am inclined to think that the disease is not to be considered as a case of pure croup; and I would not admit as cases of croup, any complications of croupy symptoms with other diseases, unless these diseases, *after weakening the membrane of the larynx and bronchia*, are superseded by croup. To us it seems, that this is a very unnecessary refinement, and that it is better to say at once, that croup, though commonly idiopathic and uncomplicated, may, like other phlegmasiæ, like cynanche, ophthalmia, or pneumonia, for example, occur symptomatically in the course of other diseases, particularly of the order exanthemata.

The operation of bronchotomy has been proposed to be attempted in the second stage of croup, seemingly, however, without a just conception of the true pathology of the disease. The inexpediency of this operation is, at any rate, very clearly made out by our author. From his observations, it appears, that it cannot be necessary for the purpose of admitting air into the trachea; for in those who have died of the disease, he has found a pervious canal, of two-eighths of an inch in diameter, and through a tube of such diameter, even an adult can support respiration for a considerable time. It is equally unfitted for the removal of the membrane; for, from its extent, variable tenacity, and adhesions, this is, in almost every case, totally impracticable; and even, could the whole membrane be removed, still the function of respiration would be but little improved, the ramifications of the trachea and bronchial cells remaining obstructed.

The observations which follow on the treatment of the croup, though short, are deserving of every attention, as being the result of considerable experience.

It is, with great truth, observed, that the first, or inflammatory stage of croup, generally lasts only eight or ten hours; and that in a disease so acute our means should be well adapted to the end. There appears no time for alterative means; and, therefore, blood-letting is a remedy hardly to be dispensed with at this time. Generally, he prefers bleeding from the jugular vein. When bleeding is performed at the commencement of the attack, the relief is often immediate; and he has

scarcely believed that he saw the same child breathing easily, who, ten minutes before, lay gasping and convulsed.

But although he does not appear to have yet acquired that confidence in the use of calomel in croup that some physicians place in it, we observe, that he speaks more cautiously, and, upon the whole, more favourably of its powers than he did in his former essay.

When the attack is alarming, he has never, indeed, in the first stage, given calomel a fair trial, having never trusted to it alone. In the second stage, nothing can be expected from it; and we are, therefore, not surprised to learn, that, though freely used in a variety of cases, all of them terminated fatally.

He observes, however, of this remedy, that "when a serious attack is apprehended, as in the croupy cough, with febrile heat, experience enables me to say, that a free use of calomel is serviceable." He thinks it applicable also to cases which arise during the currency of other diseases; to cases of the disease extending beyond the usual period, of a nature perhaps approaching to bronchial polypus; to cases where there are remarkable intermissions; and to less urgent cases, and such as occur in debilitated and scrofulous children.

Emetics are useful in every stage of croup, and are much employed and recommended by him; and, in the second stage, are considered as the chief agents.

His general plan of treatment is thus summed up:

"The means to be used when an attack of croup is apprehended, are an emetic, a bath of between 90 and 100 Fahrenheit, a dose of jalap and calomel, and dilution.

"When the first stage is formed, we have recourse to an emetic, the bath, a mercurial purge, venesection, a blister over the sternum, calomel in doses of one, two, or three grains, every hour, diluents, the antiphlogistic regimen.

"In the second stage, emetics are the chief agents."—"Half a grain of tartarized antimony, dissolved in a table spoonful of water, is to be given to a child two or three years old every quarter of an hour, until sickness and vomiting are produced; and, in two hours after the last act of vomiting, the same process is to be recommenced, and so repeated while the strength admits."—"Blisters are applied, or the breast rubbed with oil and tincture of cantharides. Medicated vapours in diseases of

the membrane of the bronchia have been highly recommended; in croup, they have disappointed my expectations. When the strength begins to flag, we use all the common cordials. One child gradually emerged from the second stage of croup, after having been in the greatest danger for three weeks; he was supported chiefly by wine and burnt brandy. As the stools are so much disordered, the state of the bowels must be attended to. The antimonial solution generally acts sufficiently on the bowels."

"There is but one indication in the first stage of croup. All our endeavours tend to moderate the increased action which prevails all over the mucous membrane.

"The bleeding, blistering, emetics, purges, and the bath, are all meant to reduce the power of the arteries, either directly or sympathetically. The mercury, however, by establishing its own influence, may be supposed to supplant that of the disease.

"In the second stage, we have various objects: 1st, We have to reduce and correct the increased action of the mucous membrane; 2dly, To promote the expectoration of the adventitious membrane and the effused fluid; 3dly, To support the patient's strength."

Of late, it has been common to distinguish two distinct cases of croup; the true and spurious, or spasmodic. The observations of our author have not enabled him to perceive the justice of this distinction. In some cases, indeed, the croupy voice and breathing have recurred in paroxysms; and when these ceased, there were intervals of natural breathing. But these, and the cases described by Dr. Ferriar and others, he seems to think differ in degree rather than in kind from true inflammatory croup. The spurious croup arises from the same exciting causes, prevails during the same state of the weather, attacks the same families and the same children who are liable to true croup, invades at the same time of night, and degenerates sometimes into inflammatory croup. It requires, indeed, a less active treatment than the inflammatory or true active croup; but the general plan is the same for both. If the symptoms be moderate, blood-letting may be omitted, and the cure trusted to emetics and calomel. But it is the state of the respiration which must guide us in making this selection.

"Until the advocates for the separate existence of spasmodic croup more fully assign and establish their grounds of belief, I am convinced, that it will be for the benefit of the patient that we should act as if there were but one kind of croup, and of every mode of this disease, previous to the unequivocal formation of the second stage, that we allow the treatment to be regulated by the state of the respiration."

"The symptoms induced by thickening of the membrane of the larynx, are pain in the larynx, not very acute, unless on pressure; some degree of fulness externally; a change in the sound of the voice; difficult and severe crowing inspiration, but slow rather than quick; an altered, sometimes stridulous voice; fits of suffocative coughing, and all those general symptoms which arise from obstructed circulation in the lungs."

Of this fatal complaint, a few very interesting cases are given; and the pathological observations of the writer are highly worthy of the reader's attention. The disease appears to be a far more common one than might be expected from the silence of most collectors.

Ulceration of the larynx, with similar symptoms, and the same fatal event, occasionally supervenes to measles and small-pox.

The next observations are on the epidemic peripneumony of children, a very common disease, and of which we have here an excellent description.

The remedies recommended by Dr. Cheyne are those used in other inflammatory affections of the lungs; vomiting, purging, bleeding, blisters, the tepid bath and diluents, repeated doses of calomel, small doses of opium after the evacuations.

We have seen a very different method of treatment recommended by Dr. James Hamilton.

The observations on peripneumonia notha are somewhat desultory, and intended to show, that other diseases of the bronchial membrane, epidemic peripneumony, and catarrh, sometimes terminate in that disease. All the diseases, he observes, which terminate in peripneumonia notha, are attended with increased action of the mucous membrane of the bronchia. Peripneumonia notha is generally a combination of this action, with the effects of a relaxed habit and weakened organ.

To conclude, we do not think Dr. Cheyne had much occasion to apologize to the purchasers of his essay on croup; for, from the numerous additions made to this, the improved arrangement of the whole, and the new and interesting pathological observations on other diseases of the bronchial membrane and larynx, this must rather be considered as a new book than as an improved edition of his former essay. Our limits have not allowed us to advert to the numerous cases, dissections, and engravings, which illustrate the text.

ORIGINAL PAPERS.

Observations on the external use of Oil of Turpentine combined with Cantharides.

BY JOSEPH HARTSHORNE, M. D.

THE efficacy of different irritating applications to the surface of the body, in subduing internal as well as external disease, has been so often demonstrated, and their use has become so familiar to all classes of practitioners, that I fear it may be deemed presumptuous to offer any new ideas on so trite a subject. Believing however, that an attempt to call the attention of enlightened physicians to this part of our science may eventually produce some improvement in practice, I venture to submit to their consideration a few desultory remarks on the external use of the Spirit of Turpentine and Cantharides.

The power which this substance possesses of changing the excitement of a burnt part from a diseased to a healthy state is now generally known. May I be permitted to ask why the use of this essential oil should be restricted to one disease of the skin? If fire produce an increase of action which has a tendency to terminate in the death of the injured part, has not the excessive excitement produced by other destructive agents the same tendency?

The disease excited by fire passes through its different stages with such rapidity that we can seldom err by a too early application of stimulants. The virus of the small-pox affects the whole system, but its principal force is exerted upon the skin, producing in that organ inflammation and ulceration, which sometimes terminate in gangrene: but as this poison operates more slowly than fire, that state of exhaustion which requires the exhibition of stimulants does not occur until near the close of the disease. In the typhus stage of the most malignant cases of variolous fever, the practice most generally approved is to give stimulants internally, and to apply epispastics to the extremities. Would not the application of the spirit of turpentine diluted with common oil, to the whole surface of the body be attended with more success?

On the 28th of May, 1809, John Mitchell, aged about forty years, was placed under my care on the third day after the eruption of casual small-pox. This was the most violent case I had ever seen. During the inflammatory stage venesection, cathartics and calomel in small doses were prescribed. It soon became necessary to change this plan of treatment, as the disease rapidly progressed to that stage of debility from which few recover. On the sixth of June the skin was entirely covered with large vesicles; pulse extremely feeble; extremities cold, and the tongue dry and hard. Peruvian bark, in the forms of tincture and decoction, was given in small doses frequently repeated. Epispastics were applied to the thighs and arms.

June 7. The epispastics produced no effect; sinapisms were now applied to the legs; they excited not the smallest degree of pain or inflammation; volatile alkali, ether, laudanum and brandy were freely administered.

June 8. The stimulating treatment was industriously continued during the whole of the last twenty-four hours; no advantage was derived from it. Respiration at this time was exceedingly laborious; pulse at the wrist scarcely perceptible, and his breath not warmer than the surrounding atmosphere. The extremities were anointed with a liniment composed of one part of spirit of turpentine and two parts of basilicon. Three hours after this liniment had been used the skin became warm, and the temperature of his breath was raised considerably. Brandy, tincture of bark, &c. were continued.

On the 9th, respiration was natural, and the skin became warm as in health. This was the first time during the whole course of his illness that the patient expressed a desire for food. He was ordered a teacupful of chicken water every two hours. The nurse however gave him a large bowlful of rich soup. Four hours afterwards he died.

By reflecting on this case, I was induced to believe that the action of cantharides on debilitated subjects might be rendered more certain by combining them with essential oils.

My friend, Dr. Calhoun, at that time resident physician of the Pennsylvania Hospital, instituted at my request a series of experiments, with a view of ascertaining the properties of a

preparation made by boiling for three hours one ounce of powdered flies in eight ounces of spirit of turpentine.*

This preparation when filtered is much more active than cantharides alone. Considerable pain is excited in less than half an hour after its application, and in about four hours vesication is generally produced. In a case of typhus fever under my care last winter, epispastics in the usual mode were applied to the wrists, and pieces of linen dipped in the decoction of cantharides were confined to the ancles. The pain created by these different applications was nearly equal; the usual burning sensation which accompanies the action of cantharides commenced earlier and ceased sooner in the parts to which the decoction had been applied. This patient received great benefit from frictions with the same preparation of cantharides diluted with linseed oil. A slight degree of inflammation and an agreeable warmth were the immediate effects of its application. The use of the frictions was continued several weeks, and were occasionally rendered more stimulating whenever the pulse seemed to flag, or the temperature of the skin to fall below the natural standard. Cordial drinks and invigorating aliment soon restored the patient to perfect health.

On the 23d of December, 1809, my friend Dr. Parrish requested me to visit with him Caleb Hatheway, aged about ten years, who laboured under typhus of a most malignant aspect. Epispastics and sinapisms had been very extensively used on the 22d and 23d; Madeira wine was at the same time freely exhibited. A feeble intermitting pulse, a discharge of dark-coloured blood from the gums, an entire insensibility to surrounding objects, an accumulation of heat about the head, and a remarkable coldness of the extremities, were symptoms that left very little room to hope for the recovery of our patient. We agreed, however, in opinion, that the use of stimulants to the skin was clearly indicated; and as we had already experienced in this case the inefficacy of mustard and cantharides in the common mode of preparing them, we determined

* As the oil of turpentine boils at a low temperature, very little fire is necessary in making the decoctions. A Florence flask and sand both may be used; or if the latter should not be at hand, a chafingdish with a few coals covered with ashes will answer the same purpose.

to use frictions upon the lower extremities with the decoction of cantharides diluted with olive oil. No other change was made in the treatment. About three hours after the frictions had been used, the feet and hands resumed their natural warmth. On the morning of the 24th the patient gave rational answers to any questions proposed to him. The frictions had inflamed the legs and thighs considerably, and in some places vesications appeared.

In the course of the day, whenever the extremities became cold, the preparation of cantharides still more diluted was applied to them. The infusion and tincture of bark in ten or twelve days completed the cure.

The relief afforded by vesicatories in diseases of the stomach and bowels is often transient, and few patients are willing to submit to their repeated application. Their inefficacy is owing in many instances to the smallness of surface to which they are applied. A more beneficial and more durable impression may be made by exciting a gentle action upon the whole external surface, than by the most intensely irritating applications to a small surface.

In several cases of protracted cholera infantum, in which internal medicines appeared to aggravate the disease, every unpleasant symptom has gradually yielded to the rubifacient plan of treatment. In the typhus, which so often succeeds bilious fever, there is no external remedy with which I am acquainted that is so powerful as the decoction of cantharides in exciting a general increase of action in the vessels of the skin. The stomach in this disease is sometimes so torpid that the purest alkohol is inert as simple water; but after the arterial system has been roused to activity by the extensive use of irritating frictions, the excitability of the intestinal canal is restored, and internal medicines may then be exhibited with great advantage.

In alleviating the pain of departing life, the last melancholy duty of our profession, experience enables me to assert, that anointing the body with warm stimulating oils is sometimes more useful than opium. At that interesting period of existence, when the patient and his friends, after abandoning all hope of recovery, still solicit the medical attendants for relief, opium, judiciously administered, will frequently succeed in

"smoothing the passage out of life:" but how often does it happen, that in consequence of exhibiting this medicine, the power of expressing pain is lost in stupor or delirium.

Case of Strangulated Hernia, with some Observations on the Treatment of mortified Omentum.

BY JOSEPH PARRISH, M. D.

ON the third day of the third month (*March*) last my immediate attendance in consultation was requested by my friend Dr. Samuel Tucker, of Burlington, N. J.

The patient was a farmer, of middle age, who led a laborious life, was of temperate habits, and the parent of six children.

He had been occasionally afflicted with scrotal hernia for fifteen years, but had never worn a truss, or disclosed his situation to any person. When it proved troublesome, he had been in the practice of reducing it without difficulty.

On the morning of the 28th of second month, while in the act of lifting a heavy log, a portion of the abdominal contents was suddenly protruded through the ring, and became strangulated. He had an alvine discharge immediately after.

From the period that Dr. Tucker first saw him, until I was called, he had diligently resorted to the most approved plans of reduction; viz., taxis, venesection, applications of ice to the tumor, tobacco injections, warm bath, &c. &c. but all without effect.

When I saw him, his chief distress appeared to arise from vomiting and hiccough; the latter always occurred after drinking. His pulse was remarkably tranquil, tongue moist, and but slightly furred; no tension or tenderness in the abdomen; and it was not until the latter part of that day that he was sensible of darting pains, which occasionally extended from the strictured part towards the abdominal cavity. The tumour was of moderate size, and rather firm to the touch.

As Dr. Tucker had decided on the necessity of the operation previously to sending for me, it only remained for us to obtain the patient's consent; but this was rather difficult, for he was very indecisive, sometimes partly consenting, and then refu-

sing. It was night when I visited him, and under all circumstances, it appeared as if nothing could be done until daylight. The mildness of his symptoms reconciled us more readily to this conclusion. He had slept well the preceding night without an anodyne. A small enema containing about two drachms of Thebaic tincture was given him, and directions were left to repeat it in an hour if the patient should be restless.

Dr. Tucker and one of his friends saw him about sunrise. He walked from his bedchamber into the common room, handed chairs, invited them to sit down, said he had passed a good night, and in fact had quite abandoned the idea of having any operation performed.

I saw him soon after; and we again endeavoured to explain to him the extreme danger of his situation, and he at last consented to the operation.

One grain of opium was exhibited, and he was placed on a table. An incision was made through the skin sufficiently large to allow a free examination of the parts about the neck of the hernial sac. While carefully dissecting through the integuments, three arteries were divided and secured by ligatures; the largest was found running directly across and just below the neck of the tumour. Several tendinous stricturing bands were brought into view and divided; but after every apparent external cause of stricture was removed, the prolapsed parts were still irreducible. The incision was extended along the scrotum nearly to the bottom of the tumour, and the hernial sac was laid open. A fluid of a bloody colour issued from it.

It was now evident that the chief seat of the stricture was in the neck of the sac; it was contracted firmly round the protruded parts. The tip of my finger was introduced as a director for the blunt pointed bistoury, with which it was readily divided.

Its contents consisted chiefly of omentum, of which there was a much larger portion than would have been imagined from the size of the tumour. I think there were nearly eight ounces. Along with this, and lying in the very centre of the omentum, was a portion of intestine, which passed about an inch and a half beyond the stricture. It appeared nearly na-

tural, but the omentum was in a very different state; a considerable part of it was sphacelated, particularly its exterior surface, which was quite black, and its vessels were greatly distended with coagulated blood. Some other portions were of a light mahogany colour, and were brittle when pressed between the fingers. The central part of the mass was chiefly natural.

The intestine was speedily reduced; but for reasons to be hereafter assigned, the omentum was left in the wound. Three sutures were used in uniting the lower part of it, so as to close it as nearly as was practicable without compressing the omentum. Soft and light dressings were applied over the whole.

The patient appeared faint about the close of the operation; he was presented with a little wine and water, but it was rejected by the stomach. He was now placed in bed, and soon sunk into an easy and profound sleep. He was in this state when I left him, about an hour and a half after the operation. His pulse was fuller, and yet free from tension.

A very light diet of chicken liquor, barley water, &c. was directed. Also, Ol: Ricini, half an ounce every two hours until it operated.

In a letter from Dr. Tucker, he reports:

"Our patient rested well the night after the operation. He took four or five spoonfuls of castor oil; it began to operate at four o'clock in the morning, and relieved his bowels five or six times. I left directions in the evening, that if the oil operated excessively, it should be checked, by taking five drops of laudanum. His wife gave him the laudanum about noon the next day.

"*Monday evening, 5th.* His bowels had not been moved since noon. I directed him to take the oil again until it operated. No fever, pulse 75.

"*Tuesday morning, 6th.* Rested well last night—no fever—or pain—pulse 75. Castor oil has operated twice.

"*Evening*—the same.

"*Wednesday morning.* Did not sleep well last night. When disposed to sleep, started, which gave him some pain, and prevented its recurrence for some time. He does not, however, appear to be worse. No fever, pulse 75—takes chicken broth, barley water, &c."

On the 11th of the month I visited him in company with Dr. Tucker. He was then perfectly free from pain and fever; no tension or tenderness in the abdomen; union, by the first intention, had taken place in the part of the wound approximated by sutures; and the living omentum situated within the wound, and in contact with its edges, appeared to have adhered to them, and to have closed the cavity of the abdomen.

Subsequent information from Dr. Tucker enables me to state, that on the 18th the last portion of unsound omentum sloughed away, leaving the living part divided into two distinct portions, suspended from the wound by two necks.

On the 21st a ligature was applied to one half of the omentum, in the manner recommended by Hey; viz., rather slight at first, and increasing gradually as the patient could bear it. On the 25th it was perfectly black and flaccid, and was removed by scissors; on the 26th another ligature was applied to the remainder, and at this time the wound had cicatrized, except where the tumour was suspended from it. In both cases there was a considerable oozing of blood after the omentum became black, but surrounding the part with lint put a stop to it. On the 5th day from the application of the last ligature the tumour was removed.

In about five weeks after the operation he began to walk about the house; and in eight he resumed his agricultural avocations, and ploughed a large field for the reception of Indian corn. Since this period he has enjoyed very excellent health, and wears a truss to guard him from future danger.

As the proper way of disposing of mortified omentum remains unsettled among surgeons, I shall assign the reasons which induced us to adopt the practice now stated.

It must be admitted by all that difficulties pressed on every side. We were afraid to cut off such a large mass, and return the living part into the abdomen, because, from the account of that eminent surgeon, W. Hey, of Leeds, such practice may involve the patient in extreme danger from subsequent hemorrhage; and he gives it as the result of his experience, that he never would do it again, unless he placed ligatures on every bleeding vessel; but instead of this, it appears that he suffered the omentum to remain in the wound.

To pass ligatures round the bleeding vessels appeared

hazardous, for they would probably have been numerous, and we were apprehensive that so many extraneous bodies in the cavity of the abdomen would increase the danger of peritoneal inflammation.

To include the whole mass in one ligature would have been simply to renew the strangulation we had been engaged in removing; and the annals of surgery are not deficient in histories of the fatality of such practice.

Under these impressions, we were united in imitating the plan recommended by the candid and experienced Hey, and the event has justified our most sanguine expectations.

I am aware that objections have been offered to this practice, and confess myself not a little surprised to find it totally rejected in the late valuable Surgical Dictionary, by Samuel Cooper, who appears to found his opinion on a most excellent treatise on hernia, by William Lawrence, which I have perused with pleasure and instruction. And as the object of these writers appears to be the attainment of truth, they will, no doubt, excuse a diffident attempt to examine the arguments which they offer on the occasion. In Lawrence, page 180, et seq., we are informed,

"Some surgeons have recommended that the omentum should be left in the wound, particularly in an old hernia where the parts have been long down.

"Cases are recorded, which show the safety of this practice, and which prove that granulations extend over the omentum, and that a firm cicatrix ensues.* This practice, which I cannot speak of from my own observation, does not appear to me to deserve recommendation. It is attended with no particular advantage, and certainly exposes the patient to the possibility of ill consequences. The omentum left in the wound must be liable to injury, inflammation, or disease; and hence arises a source of danger to the patient. Unnatural adhesions, formed by this part, have greatly impaired the functions of the stomach. Cases are recorded where the unfortunate patient has never been able to take more than a certain quantity of food, without bringing on instant vomiting; and even where it has

"* Hey, p. 180, et seq. Chopart and Dessault state, that when the omentum is irreducible merely from its bulk, they leave it in the wound, and it gradually retires into the abdomen. *Traité des Mal. Chir.* tom. II. p. 269.

been necessary for all the meals to be taken in the recumbent position, with the trunk curved and the thighs bent.† To avoid the possibility of such afflicting consequences, we should, after removing any diseased portion, carefully replace the sound part of the omentum in the abdominal cavity, that no obstacle may exist to its regaining that situation, in which its connexions with the stomach and colon would naturally place it."

Now in reply to the objection that the omentum is liable to injury, &c. I have only to observe, that in the present instance no difficulty occurred about keeping it from injury, and no inflammation supervened. The same appears to have been the experience of Hey with his patient.

As relates to the dreadful train of symptoms produced by adhesions of the omentum, as mentioned by Gunz, I must again express my surprise, that these respectable surgeons should be under the necessity of quoting foreign writers, instead of giving us their own experience, or that of some of their brethren at home; for, although I do not feel disposed to doubt the authority, yet such cases must be very uncommon, or they would have occurred in the practice of some of the most celebrated surgeons of Great Britain.

Thus we read of Percival Pott operating on a large irreducible epiplocele that was troublesome merely on account of its bulk. Now we must conclude, that if the dreadful symptoms attendant on adhesion had occurred, they could not have escaped his notice, but would have been offered as a reason for performing so hazardous an operation.

Astley Cooper, a later writer, could not have laboured under apprehensions of this kind; for in his valuable work on hernia he mentions cases where, after cutting off the omentum, he left it in the mouth of the hernial sac, hoping that it would adhere to it, obliterate the opening, and thus produce a radical cure.

I confess that my anxiety was excited on account of danger from adhesion; but the issue of the case has proved it groundless. And when we recollect the admirable power of the system to adapt itself to exigencies whereto it is subjected,

"† *Gunz. Obs. Anat. Chir. de Herniis. Memoires de l'Academie de Chirurgie,* tom. III. p. 406."

it is not surprising, that either by an elongation of the parts, or in some extraordinary manner, anticipated danger is eluded.

With respect to placing ligatures on the bleeding vessels, it may be proper to remark, that I do not find one single case of the kind recorded in Cooper on Hernia: The portions cut away were small, and ligatures were not requisite. But in the second volume of Transactions of a Society for the improvement of Medical and Chirurgical Knowledge, a case is related by Everard Home, where two ligatures were placed on the divided omentum; the intestine involved in the stricture was found in a diseased state; the patient died on the tenth day from the operation, and her death was referred to enteritis previously induced.

Now it appears reasonable to conclude, that a small quantity of omentum may be cut off with impunity, while the danger from hemorrhage would be great when a larger portion is subjected to the same treatment; because the nearer to its origin, the greater the size of the vessels. In the present instance, they were large and numerous.

Upon the whole, it seems not uncandid to conclude, that as Lawrence informs us, that on this particular point he cannot speak "from his own observation," he does not pursue the right plan of treating a practical subject, who places his mere opinion in opposition to the experience of a surgeon justly entitled to great eminence, who assures us that he has had "three patients of the kind, all of whom recovered." Hey, p. 131.

It is the more extraordinary, because the same writer, when treating of the management of mortified intestine, very judiciously condemns the practice of cutting away that portion of the bowel; observing, that "almost all the numerous instances of recovery from mortified hernia, recorded in the annals of surgery, took place where the surgeon was contented to remain a quiet spectator of the process, without interfering with any artificial means of uniting the divided intestine," &c. Lawrence on Hernia, p. 202. And immediately after, in page 203, he quotes the opinions of J. L. Petit and Richter, "two celebrated men, whose acknowledged abilities and extensive experience entitle them to the greatest attention." The quotation from the former is so very appropriate, that I shall venture to transcribe it.

" Cette observation, et quelques autres, que j'ai rapportées ci-dessus, prouvent bien, que les guerisons, qui paroissent miraculeuses, sont dûes a la nature plus qu'a l'art.

" Heureux les malades, qui tombent entre les mains des chirurgiens bien convaincus de cette verité; ceux-ci s'attacherent seulement à eloigner tout ce qu'ils croiront pouvoir troubler au interrompre la nature dans ses fonctions, et n'en auront pas moins de gloire." *Traité des Mal. Chir.* tom. ii. p. 403, 404.

If, then, we are strictly enjoined to avoid interfering with nature in the case of a mortified bowel, why may not the same rule apply to a *large portion of omentum* in the same state, more especially, as there is reason to believe that the living omentum situated within the parietes of the wound, will soon adhere to them, and render the cavity of the abdomen complete.

Happily for us, those cases do not very often occur. The present one has issued in a most favourable manner. Yet, if it should appear from the experience, but not the speculation of others, that another plan is preferable, I can say with the utmost sincerity, that I should rejoice to adopt any improvement calculated to mitigate the sufferings of afflicted humanity.

Philadelphia, 9th month, 10th.

Case of Premature Labour artificially induced.

BY Dr. T. C. JAMES.

IN June 1804 I was requested to see, in consultation with the late Dr. Church of this city, a young married lady living in Fourth near South street, then in labour with her first child. Upon visiting her, I found that she had suffered several hours with the severest pains, which had then ceased to produce any progress in the labour.

The pelvis having, upon examination, been found to be preternaturally small; her strength failing; and some threatening symptoms having occurred, it was ultimately agreed, as the head presented, to proceed, as a dernier though painful resource, to open it and deliver by the crochet. This was accordingly accomplished, although with some difficulty.

She recovered from the parturient state as rapidly as we could have expected or even wished; and as in the course of examination during the progress of delivery we had satisfactorily ascertained the preternaturally small dimensions of the pelvis, we gave it as our joint opinion, upon being interrogated on the subject by the friends of the lady, that she could not bear a full grown living child at the full period of utero-gestation.

Her husband dying not long after, she did not again become pregnant until after a second marriage, when Dr. Mongez was engaged to attend her during parturition. She accordingly fell in labour in August 1809, and I was again called into consultation on her case. She had been in labour upwards of twenty-four hours, when, from our previous knowledge of her case, from the comparative large size of the head of the child, and from several unpleasant symptoms in our patient, we thought ourselves called upon, although with sentiments of extreme regret, again to make use of the crotchet.

With considerable and long continued exertions on the part of both of us, we ultimately succeeded, after several hours, in delivering her of the child, which most probably had been dead some time, as we were induced to conclude from existing marks, which could not readily have deceived us.

Upon our opinion being requested we again agreed to state, that our patient probably could never bear a living child at the full period of utero-gestation. We therefore advised, that if she should again find herself in that situation, she should adhere to an abstemious regimen, be occasionally bled, and from time to time take a cathartic; and that at the period of seven months from conception, premature labour should be induced by rupturing the membranes. We were justified in this plan by the respectable authorities of Denman, Barlow, and several other experienced accoucheurs.

Dr. Mongez saw the patient from time to time, and informed me in the spring of the present year [1810] that she was again pregnant, and that both herself and her friends were anxious that the plan we had proposed should be carried into effect. Not long after she called upon me, and appeared to be willing that the experiment should be tried.

On the 26th of June, 1810, when, according to the most accu-

rate account we could procure, she was at the end of the seventh month of pregnancy, we examined her *per vaginam*, and during the examination found the os uteri dilating to nearly the size of a half dollar, and that the oviform presentation of the membranes could be distinctly felt.

As she was to be removed from Queen street, where she then dwelt, to her mother's house in Union, near Fourth, previously to rupturing the membranes, we contented ourselves with recommending venesection and an enema for the present. On the 27th she was removed to her mother's, and on the evening of that day I was informed by Dr. Mongez that the membranes had spontaneously ruptured with very little pain.*

On the 29th in the morning, about 8 o'clock, I was requested by the husband to meet Dr. Mongez at her mother's house, which I accordingly did. We found that labour had commenced, and upon examination, about half past 9 A. M. the *os uteri* was found to be considerably dilated, so that the presentation could be clearly distinguished, the posterior fontanelle being towards the left acetabulum.

We agreed, as there were no reasons to justify precipitation, to suffer the labour to proceed, and by about half past ten A. M. she was delivered of a living female child, which, as we had previously calculated, appeared to be at the period of seven months from conception.

By the third of July the secretion of milk was fully established. The child took nourishment by the spoon, and attempted to suck, but not with as much success as we could have wished. It notwithstanding lived until the 19th of the month, when it expired, partly, we believe, in consequence of mismanagement in the nursing. The mother happily recovered.

Dr. Denman, who appears to have paid particular attention to this subject, observes, that at the first account of any artificial method of bringing on premature labour was given to him by Dr. Kelly. In the year 1750 the propriety of this plan appears

* This spontaneous rupture, if it may be so termed, must be attributed to the irritation produced by the examination made the day preceding; Dr. Mongez having then, as he informed me, after the partial dilatation of the os uteri, endeavoured to scratch the membranes with the nail of his forefinger. Hence contraction of the uterus must have been in a degree produced, and the rupture of the membranes necessarily facilitated.

to have been sanctioned by a consultation of the most eminent practitioners in London, and the first case in which it was deemed necessary and proper, and which terminated successfully, fell under the care of Dr. Macauly, much celebrated at that period as an accoucheur.

Since which Dr. Denman, having carefully attended to all the circumstances which had occurred when it had been performed in more than twelve cases, in which he had either performed it or where it had been done by his advice and persuasion, he has not, he says, known one untoward or hazardous accident that could be imputed to it, and in the greater number of those cases the children have been born living, whilst it has been perfectly safe to the person on whom it has been performed.

The respectable physician whom we have just quoted has recommended also bringing on premature labour in those women who readily conceive, proceed regularly in their pregnancy till they approach the full period, when, without any apparent cause, they have been repeatedly seized with rigours, and the child has instantly died, though it may not have been immediately expelled. In two cases of this kind he proposed bringing on premature labour, and succeeded in preserving the children without hazard to the mothers. There must of course, in these cases, as he acknowledges, be always something of doubt, whether the child might not have been preserved without the operation.

The next practitioner of character, whose writings I have met with, who recommends bringing on premature labour, in cases where the diameter of the pelvis is preternaturally small from distortion, is John Barlow, surgeon at Bolton, in Lancashire, England. This gentleman, in a paper that he published in the eighth volume of the Medical Facts and Observations, details several cases which proved the propriety of the practice which he appears to have pursued during several years with success. He was in the habit of exciting premature labour early in the seventh month, whenever he was consulted in time by distorted patients. In many of these cases the children were born living, and in some lived for several years.

The great objects of this operation, if such it may be termed, would appear to be to obviate the necessity of the Cæsarian

section, by which the life of the mother is brought into the greatest possible danger on the one hand, and on the other, to prevent the occasion of embryulcia, by which the infant is necessarily sacrificed in a manner the most abhorrent to the feelings of the practitioner.

Authors have stated that the dimensions of the pelvis that require and justify the inducing premature labour are from two to two and a half inches from pubes to sacrum; but as it is often difficult if not impracticable to determine the precise dimensions of the pelvis or of the child's head previously to delivery, and of course the precise relations between them must be unknown, it has therefore been judiciously said by Dr. Denman, that "under circumstances and in situations just preventing the successful use of the forceps, and just compelling us to the fatal measure of lessening the child's head, it may become a duty to propose on a future occasion the bringing on premature labour; at seven months or at any later time, according to our sense of the disproportion existing between the head of the child and the cavity of any particular pelvis."

With respect to the *time* of inducing labour, we may just be permitted to observe, that, as a general rule, the operation should not be performed sooner than the end of the seventh month, and that the eighth month may often be considered as preferable. Dr. Denman relates a case in the third volume of the Medical and Physical Journal, where it was performed about midway between the seventh and eighth month, and where the child lived, a wet nurse having been previously provided, which, in fact, should always be done, for reasons which are too obvious to need recital.

Philadelphia, August 6, 1810.

ORIGINAL REVIEW.

Cases of Organic Diseases of the Heart, with Dissections, and some Remarks intended to point out the Distinctive Symptoms of these Diseases, read before the Counsellors of the Massachusetts Medical Society. By John C. Warren, M. D. 8vo. pp. 61. printed at Boston by Thomas B. Wait & Co. 1809.

IN this work Dr. Warren has presented the public with the history of ten cases, where the dissections showed the heart to have undergone considerable derangement in its structure. Some of the cases are related with a minuteness which will be acceptable to every one, who wishes to become acquainted with the symptoms which attend the diseases of this important organ. The dissections, with one exception, appear to have been made by Dr. Warren, and are highly creditable to his zeal, and to the liberality of the people among whom he exercises his profession. The following extract contains the result of Dr. Warren's observations, and will best explain his views and ideas of the organic diseases of the heart, and of the symptoms by which such affections may be distinguished from those disorders with which they have been frequently confounded.

"ENUMERATION *of the principal morbid changes, observed in the organization of the heart, in the preceding cases.*

Enlargement of the volume of the heart, or aneurism.*

Increase of the capacity, or aneurism of the right auricle, } with thickened, or thin, parietes.
. . . . . of the right ventricle, }
. . . . . of the left auricle, }
. . . . . of the left ventricle, }
. . . . . of the aorta, with thickening of its coats.

Fleshlike† thickening of the mitral valves.
. . . . . of the aortal valves.
. . . . . of the aorta.

Cartilaginous thickening of the internal membrane of the heart, and generally of its valves.

* Morgagni uses this term, which he borrows from Ambrose Pare, to express dilatation of the cavities of the heart. It seems to be as applicable to the dilatation of the heart, as to that of an artery. I have therefore adopted it in this enumeration.

† The term fleshlike is employed to express that roughness of the valves, which somewhat resembles flesh in its appearance, but which is very different from the thickening of the parietes of the heart.

Ossification of the parietes of the heart.
. . . . . mitral valves.
. . . . . aortal valves.
. . . . . aorta.
. . . . . coronary arteries.

"ENUMERATION *of the principal morbid appearances, observed in these cases of disease of the heart, which may be considered secondary.*

IN THE CAVITY OF THE CRANIUM.

Inflammation of the meninges.
Water between the meninges.
Water in the ventricles.

IN THE PLEURA AND ITS CAVITY.

Inflammation and thickening of the pleura.
Collection of water in its cavity.
Lungs dark coloured.
..... generally very firm, and particularly in some parts.
..... loaded with black blood.
..... crowded into a narrow space.

IN THE PERICARDIUM AND ITS CAVITY.

Inflammation and thickening of its substance.
Adhesion to the heart and lungs.
Collection of water in its cavity.

IN THE CAVITY OF THE ABDOMEN.

Collection of water.
Liver very full of fluid blood.
..... having its tunic flaccid and inflamed.
Mesenteric veins full of blood.

CELLULAR MEMBRANE full of water.
THE BLOOD every where fluid, except in the cavities of the heart.

REMARKS.

"The symptoms, which are most observable, in some or all of the preceding cases, are the following:

"The first notice of disorder is commonly from an irregular and tumultuous movement of the heart, which occurs some time before any perceptible derangement of the other functions. This irregularity slowly increases, and arrives at its height before the strength of the patient is much impaired, at least in the cases which I have noticed; and as the vigour of the patient lessens, the force of the palpitations diminishes. These palpitations are often so strong, as to be perceptible to the eye at a considerable distance. They are seldom most distinct in the place where the pulsation of the heart is usually felt.

Sometimes they are perceived a little below; often in the epigastric region; and not unfrequently beneath, and on the right side, of the sternum.

"After the palpitations have lasted some time, a little difficulty of breathing, accompanied with sighing, is perceived, especially on any great exertion, ascending an eminence, or taking cold, of which there is an uncommon susceptibility. This dyspnœa becomes, as it increases, a most distressing symptom. It is induced by the slightest cause; as by an irregularity in diet, emotions of the mind, and especially movement of the body; so that on ascending stairs quickly, the patient is threatened with immediate suffocation. It occurs at no stated periods, but is never long absent, nor abates much in violence during the course of the disease. It is attended with a sensation of universal distress, which perhaps may arise from the circulation of unoxygenated blood, or the accumulation of carbon in the system; for the countenance becomes livid, and the skin, especially that of the extremities, receives a permanent dark colour. This dyspnœa soon causes distress in lying in a horizontal posture. The patient raises his head in bed, gradually adding one pillow after another, till he can rarely, in some cases never, lie down without danger of suffocation; he inclines his head and breast forward, and supports himself upon an attendant, or a bench placed before him. A few hours before death the muscular power is no longer capable of maintaining him in that posture, and he sinks backward. The dyspnœa is attended with cough, sometimes through the whole of the disease, sometimes only at intervals. The cough varies in frequency. It is always strong, and commonly attended with copious expectoration of thick mucus, which, as the disease advances, becomes brown coloured, and often tinged with blood; a short time before death it frequently consists entirely of black blood.

"The changes in the phenomena of the circulation are very remarkable. The sanguiferous system is increased in capacity; the veins, especially, are swelled with blood; the countenance is high coloured, except in fits of dyspnœa, when it becomes livid; and it is very frequently puffed, or turgid. The brightness of the eyes, dizziness, which is a common, and headache, which is a frequent symptom, and in some cases very dis-

tressing, are probably connected with these changes. The motions of the heart, as has already been stated, are inordinate, irregular, and tumultuous. The pulse presents many peculiarities. In some cases, probably where there is no obstruction in the orifices of the heart, it remains tolerably regular, and is either hard, full, quick, vibrating and variable, or soft, slow, compressible and variable. Most commonly, perhaps always, when the orifices of the heart are obstructed, it is vibrating, very irregular, very intermittent, sometimes contracted and almost imperceptible, very variable, often disagreeing with the pulsations of the heart, and sometimes differing in one of the wrists from the other.

"The functions of the brain suffer much disturbance. Melancholy, and a disposition for reverie, attend the early stages of the complaint; and there is sometimes an uncommon irritability of mind. The dreams become frightful, and are interrupted by sudden starting up in terror. Strange illusions present themselves. The mental faculties are impaired. The termination of the disease is attended with slight delirium; sometimes with phrensy, and with hemiplegia.

"The abdominal viscera are locally, as well as generally, affected. Although the digestive functions are occasionally deranged, the appetite is at some periods remarkably keen. The action of the intestines is sometimes regular, but a state of costiveness is common. The liver is often enlarged, probably from accumulation of blood. This distention is attended with pain, varies much, and, in all the cases I have seen, has subsided before death, leaving the coats of the liver wrinkled, flaccid, and marked with appearances of inflammation, caused by the distention and pressure against the surrounding parts. An effect of the accumulation of blood in the liver, and consequently in the mesenteric veins, is the frequent discharge of blood from the hæmorrhoidal vessels. This occurs both in the early and late stages of the disease, and may become a formidable symptom. Evacuations of blood from the nose are not uncommon.

"Dropsical swellings in various parts of the body succeed the symptoms already enumerated. They commence in the cellular membrane of the feet, and gradually extend up the legs and thighs; thence to the abdominal cavity, to the thorax, some-

times to the pericardium, to the face and superior extremities; and, lastly, to the ventricles and meninges of the brain. These collections of water may be reabsorbed by the aid of medicine; but they always return and attend, in some degree, the patient's death.

"There is no circumstance more remarkable in the course of this complaint, than the alternations of ease and distress. At one time the patient suffers the severest agonies, assumes the most ghastly appearance, and is apparently on the verge of death; in a day or a week after, his pain leaves him, his appetite and cheerfulness return, a degree of vigour is restored, and his friends forget that he has been ill. The paroxysms occasionally recur, and become more frequent, as the disease progresses. Afterwards the intermissions are shorter, and a close succession of paroxysms begins. If the progress of the complaint has been slow, and regular, the patient sinks into a state of torpor, and dies without suffering great distress. If, on the contrary, its progress has been rapid, the dyspnœa becomes excessive; the pain and stricture about the præcordia are insupportable; a furious delirium sometimes succeeds; and the patient expires in terrible agony."

Dr. Warren considers "the incurvation of the body forward" as pathognomonic of organic diseases of the heart. Among the various medical records which we have consulted, we have met but two cases where this symptom is noticed. In both the pericardium was found filled with blood. One case of violent pneumonic disease, which has occurred periodically for some years, has come to our knowledge; during the attacks the person finds no ease but when sitting with his head bent forward and resting on a pillow. We do not wish to call in question the accuracy of Dr. Warren's observation; but are desirous of inviting inquiry, and shall be happy to learn that what he has stated is confirmed by the experience of others.

Two plates executed in a style of great neatness and perspicuity accompany the work. The first represents the inside of the aorta laid open, exhibiting the valves, (which are here but two in number) thickened and ossified. The second plate is the representation of a fleshlike thickening seen on the inner surface of the aorta.

Medical and Philosophical Intelligence.

THE following report was read at the last annual meeting of the governors of the London Vaccine Institution.

"The board of managers have the happiness to inform the annual meeting, that the cause of vaccination still continues to flourish under their auspices. This is evinced by the numerous applications for matter, not only in the metropolis, but from all parts of the united kingdom, the colonies and countries abroad.

They have great pleasure in observing the increasing progress of vaccination; their returns being greater than on any former year. It appears that since the last annual report, there have been inoculated by Dr. Walker 2,087; from the beginning 6,105. By the appointed inoculators in the metropolis last year 1,105; from the beginning 2,163. By the appointed inoculators in the country last year, 54,665; from the beginning 156,573.

Dr. Walker, since the last report, has supplied to 3,973 applicants, 19,865 charges of matter. From the beginning, to 12,361 applicants, 61,088 charges.

In having been enabled to effect the foregoing incalculable services to society at large, the board of managers have to acknowledge a liberal support from a generous public; yet they owe to that public, and to the cause of vaccination, the statement of the fact, that the support of this most extensively useful establishment requires still further contributions, to enable the managers to completely effect the vast, patriotic and philanthropic plan.

It is to be lamented, that the fatal malady which has, during the last thousand years, committed ravages the most dreadful in every quarter of the world, is not extinct in the metropolis. The board of managers, however, request the attention of every member of the institution to this most important and gratifying circumstance; namely, that while 1163 have died of the small-pox, during the last year, as appears from the bills of mortality, not a single instance of the kind is represented as having occurred from vaccination."

Bohan Upas, or Poison Tree of Java.

AT a late meeting of the Royal Society, the translation of a paper by M. Delille was read, describing the real nature and properties of the celebrated Bohan Upas, or poison tree of Java. The author, a French physician, and a member of the National Institute of Egypt, transmitted this paper from the East Indies to the Royal Society, by an English lady. The botanical account of the plant in question, he received from one of the French naturalists who accompanied captain Baudin, and who resided some time in Java, where he visited the interior of the country, and with much difficulty prevailed on the natives to show him the different poison plants, which they carefully conceal, for the purpose of using them in war. Hence the many fabulous accounts that have been circulated respecting the fatal influence of the Upas; which in the language of the Javanese signifies vegetable poison, and is applied only to the juice of the Bohan Tree, and another plant with a twisted stem. The former is a large tree, which the writer considers as a new genus; the latter, yielding an equally powerful poison, is of the woodbine family. The Upas, or juice, is extracted by an incision made in the bark with a knife, and being carefully collected, is preserved by the natives to be employed in their wars. As to its diffusing noxious effluvia in the atmosphere, and destroying vegetation to a considerable distance around it, the absurdity of these stories is sufficiently exposed by the fact, that the climbing species requires the support of other plants to attain its usual growth. Dr. Delille made several experiments with the Upas on dogs and cats. An incision was made in the thigh of a dog, into which were dropped eight grains of the juice. The dog soon began to vomit, and continued vomiting at intervals till he became convulsed, and died in twenty minutes. Six grains were put into the thigh of another, which was seized with the same symptoms, and died in fifteen minutes. A cat was treated in like manner, but the effects were more powerful and speedy; she expired in a few minutes. All these animals died howling and in great agony. The author also made several experiments on the effects of this poison when applied internally. A grain and a half being introduced into the stomach of a dog, produced

only a slight purging. To another were given four grains, which in about four hours produced the same effect, together with vomiting, and the dog died in the course of half a day. On examining the bodies of these animals after death, no very extraordinary appearances were discovered; the ventricles of the heart were full of blood, and some slight traces of inflammation appeared in the stomach; but the derangement was not so great as might have been expected from such a violent and sudden death. From this circumstance the author concluded, that the absorbents had transmitted the poison to the nerves of the stomach, and that this peculiar species of vegetable poison acts exclusively on the nerves.

Pearson's Experiments on Expectorated Matter.

IN June, 1809, a paper was read before the Royal Society of London, on the matters raised from the lungs by human beings. These Dr. Pearson arranges under seven heads: 1. The jelly-like, semi-transparent kind, of a blueish hue, excreted in the healthy state. 2. The thin mucilage-like transparent matter, so copiously expectorated in bronchial catarrhs. 3. The thick, opake, straw-coloured or white and very tenacious matter, coughed up in a great variety of bronchial and pulmonary affections; especially in that of tubercles. 4. Puriform matter secreted without any division of continuity or breach of surface of the bronchial membrane, very commonly occurring in pulmonary consumptions. 5. The matter which consists of opake viscid masses, together with transparent fluid, or the second sort above stated, with nodules of the third or fourth kind. 6. Pus from the vomicæ of tubercles; and 7. Pus from vomicæ by simple inflammation of the lungs, and without tubercles. From a variety of experiments made on the five former of these substances, by caloric, alcohol, water, vinegar, and other agents, Dr. Pearson concludes that the several sorts of expectorated matter do not differ in the ingredients of their composition, but merely in the proportion of them to one another. He shows that they chiefly consist of *coagulable* or *albuminous* animal substances, instead of mucus, as heretofore believed; of which about one twelfth or one tenth may be called an animal oxyd; and a considerable proportion is eva-

porable water, impregnated with several saline and earthly bodies. Besides muriate of soda, he found potash in these expectorated fluids: to wit, from half to three fourths of a part per thousand of potash, while the common salt varied from one and a half to two and a half parts in a thousand; and the neutralized potash he also found in the blood, dropsy fluid, pus of abscesses, pus secreted without breach of surface, the serum effused from blisters, urine, and the slimy secretions from the nostrils in catarrhs. So that potash may now be ranked among the constituent parts of animal matter.

University of Pennsylvania.

THE Trustees of the University of Pennsylvania, with a view to a more complete system of *Medical Education* in that seminary, have lately established a professorship of NATURAL PHILOSOPHY for the medical department, and divided the professorship of ANATOMY and MIDWIFERY into two separate professorships.

Dr. Caspar Wistar is elected the professor of Anatomy; Dr. Thomas C. James the professor of Midwifery; and Robert Hare, jun. esq. the professor of Natural Philosophy.

College of Physicians of Philadelphia.

AT a stated meeting of the College of Physicians, held on the third of July 1810, the following gentlemen were chosen officers for the ensuing year.

Dr. Adam Kuhn, president.
Dr. Samuel Duffield, vice-president.
Dr. Thomas C. James, treasurer.
Dr. Thomas T. Hewson, secretary.
Dr. Thomas Parke,
Dr. Samuel P. Griffitts,
Dr. Caspar Wistar,
Dr. William Currie,
} Censors.

Foreign Publications.

NEW WORKS AND RECENT EDITIONS.

Practice of Medicine.

PRACTICAL Observations on Disorders of the Stomach, with Remarks on the use of the bile in promoting Digestion. By George Rees, M. D. member of the Royal College of Physicians, senior physician to the London Dispensary, &c. &c. Price 6s. in boards.

An Essay on the Nature of Scrofula; with evidence of its origin from disorder of the digestive organs; illustrated by a number of cases successfully treated, and interspersed with observations on the general treatment of children. By Richard Carmichael, surgeon. 8vo. 5s. boards.

A Practical Essay on Cancer; being the substance of Observations to which the Annual Prize for 1808, was adjudged by the Royal College of Surgeons, London. By Christopher Turner Johnson, surgeon of Exeter, member of the Royal College of Surgeons of London, and of the Royal Medical Society of Edinburgh. 8vo. 5s. 6d.

Observations on the Hydrargyria; or that Vesicular Disease arising from the exhibition of Mercury. By George Alley, M. D. M. R. I. A. Fellow of the Royal College of Physicians of Edinburgh. Embellished with three engravings. 4to. 14*s*. boards.

The Modern Practice of Physic: exhibiting the characters, causes, symptoms, prognostic, morbid appearances, and improved method of treating Diseases. By Robert Thomas, M. D. of Salisbury. A third edition, considerably enlarged, in one neat and very close printed volume, 8vo. 14*s*. This work has been again carefully revised; and a large portion of new and important matter has been added.

A Practical Treatise on the Venereal Disease, describing the nature, symptoms, and cure of the Diseases arising and connected with it; third edition, illustrated with cases. By T. M. Caton, surgeon. 4s. 6d.

A Treatise on Local Inflammation, more particularly applied to Diseases of the Eye. By T. B. Sterny, M. D. Oculist.

Advice to Mothers, of the greatest importance in the Treatment of Children during Infancy; from the German of Hufeland. A new edition. 2*s*. 6*d*. sewed.

An Essay on the Nature of Fever; being an attempt to ascertain the Principles of its Treatment. By A. Philips Wilson,

M. D. F. R. S. Ed. Fellow of the Royal College of Physicians of Edinburgh, &c. 8vo. 5s.

Letters on the Cause and Treatment of the Gout, with Remarks on other medical subjects. By Robert Hamilton, M. D. of Lynn. Fellow of the London and Edinburgh Colleges. 5s. boards.

A Practical Treatise on Tinea Capitis Contagiosa, and its cure. By William Cooke, surgeon.

A familiar Essay, explanatory of the Theory and Practice of Prevention of Venereal Contagion. By a member of the Royal College of Surgeons, London, royal 8vo. 10s. 6d.

A Scientific and Popular View of the Fever of Walcheren, and its consequences, as they appeared in the British troops returned from that country. By J. R. Davis, M. D. 8vo. 7s.

An Inquiry into the Nature, Causes, and Cure of Hydrothorax: illustrated by interesting cases, and many examples of the success of the mode of treatment recommended. By C. M'Clean, M. D. 8vo. 12s.

Observations on the Walcheren Diseases which affected the British soldiers in the expedition to the Scheldt. By G. P. Dawson, member of the Royal College of Surgeons, London.

A New System of Physic and Medical Surgery: illustrating the Nature of Animal Life, and the Phenomena of Diseases; and detailing a more scientific Method of treating the various Disorders that occur in the Human Body. By Richard Reece, M. D. Member of the Royal College of Surgeons of London, &c. 8vo. 12s. boards.

Observations on Indigestion: in which is satisfactorily shown the efficacy of Ipecacuanha in relieving this, as well as its connected train of complaints peculiar to the decline of life. Translated from the French Memoir of M. Daubenton, Member of the Royal Medical Society at Paris. Third edition, with additions, by Dr. Buchan. 8vo. 1s. 6d.

Surgery.

A System of Surgery. By James Russell, F. R. S. E. Fellow of the Royal College of Surgeons, one of the Surgeons to the Royal Infirmary, and Professor of Clinical Surgery in the University of Edinburgh. 4 vols. 8vo.

Practical Observations on the Nature and Cure of Strictures in the Urethra. By William Wadd, member of the College of Surgeons in London. 3s.

Observations on some of the principal Diseases of the Rectum and Anus; particularly Stricture of the Rectum, the Hemorrhoidal Excrescence, and the Fistula in Ano. By Thomas Copeland, Fellow of the College of Surgeons, and Assistant-Surgeon to the Westminster General Dispensary. London, 8vo. 5s. boards.

Observations on the Disease of the Hip-Joint; to which is added, some Remarks on White Swellings of the Knee, the Caries of the Joint of the Wrist, and other similar complaints. The whole illustrated by Cases and Engravings, taken from the diseased parts. By the late Edward Ford, esq. F. S. A. 8vo. 12s. boards.

Letters concerning the Diseases of the Urethra. By Charles Bell. Handsomely printed in 8vo. and illustrated with six beautiful engravings, after designs by the author. 7s. 6d.

Practical Observations on Urinary Gravel and Stone; on the Diseases of the Bladder and Prostate Gland; and on Strictures of the Urethra. By Henry Johnston, Fellow of the Royal College of Surgeons of Edinburgh. 8vo. 5s.

Practical Essays and Observations on the Nature and Causes of Tabes Dorsalis. By H. St. John Neale; 3d edition improved.

Familiar Instructions for the Management of the Teeth and Gums, in order to preserve the teeth from diseases and render them firm in their socket. By J. P. Hertz, Surgeon Dentist.

A Treatise on Ruptures; containing an Anatomical Description of each species; with an account of its symptoms, progress and treatment. Illustrated with plates. By William Lawrence, member of the Royal College of Surgeons, and Demonstrator of Anatomy at St. Bartholomew's Hospital. Second edition, corrected and considerably enlarged. 8vo. boards, 10s. 6d.

Surgical Observations, part II. On the Origin and Treatment of Pseudo-Syphilitic Diseases, and on the Diseases of the Urethra. By John Abernethy, F. R. S.

Midwifery.

The London Practice of Midwifery; chiefly designed for the use of Students and early Practitioners. Including the Management of women during Pregnancy, and after Delivery; with the Treatment necessary in the principal Diseases of Children. Second edition, attentively revised, corrected and enlarged. In a neat pocket volume. 6s.

Observations on the Rupture of the Uterus, on the Snuffles in Children, and on Mania Lactea. By Thomas Dennan, M. D.

Chemistry.

A System of Chemistry. By J. Murray, Lecturer on Chemistry, Materia Medica, and Pharmacy, Edinburgh. Second edition, enlarged, and containing the late numerous and important discoveries of Mr. Davy and others, 4 vols. 8vo. with plates. 2l. 8s.

A Dictionary of Practical and Theoretical Chemistry, including its application to the Arts and Manufactures, and to the explanation of the Phenomena of Nature, including throughout the latest discoveries, and the present state of knowledge on those subjects. With plates and numerous tables. By William Nicholson. 8vo. 20s. boards. This work, though formed on the basis of the Dictionary published several years since by the same author, in 2 vols. 4to., is in effect an entirely new work, the articles being either considerably enlarged, or entirely rewritten, and in every instance adapted to the present improved state of Chemical Science.

A General Dictionary of Chemistry; or the leading Principles of the Science, in regard to Facts, Experiments, and Nomenclature. By W. Nisbet. 12mo. 8s. 6d. boards.

Materia Medica.

A Practical Synopsis of the Materia Alimentaria and Materia Medica. By Richard Pearson, M. D. Member of the Royal College of Physicians, and formerly Physician to the General Hospital, near Birmingham. A new edition, comprising the latest improvements in the London, Edinburgh, and Dublin Pharmacopœias, complete in one volume 8vo. 12s.

"This very useful and scientific work, which at first was published anonymously, was noticed by us in various stages of its progress with approbation. It is now avowed by a physician of eminence, and appears in an enlarged and improved form, and we can recommend this work of Dr. Pearson as a synopsis of the most useful and masterly kind." *British Critic.*

A Treatise on Diet, by an eminent physician.

Natural History.

British Fauna, containing a Compendium of the Zoology of the British Islands: arranged according to the Linnæan system. By W. Turton, M. D. F. L. S. 8vo. 10s. 6d.

An Introduction to the Study of Cryptogamous Plants. Translated from the German of Kurt Sprengle, M. D. With coloured Plates. 18s.

A Treatise on the External Characters of Fossils. Translated from the German of Abraham G. Werner. By Thomas Weaver. 8vo. 8s.

The Select Works of Anthony Van Luenhoek, F. R. S. Translated from the Dutch by Samuel Hoole. 2 vols. 4to. 24s.

The Natural History of British Insects, together with the History of such minute Insects as require investigation by the Microscope: the whole illustrated by coloured plates. By E. Donovan. Vol. xiv. 4to. 31s.

Miscellanies.

A Selection of the most interesting Cases that have occurred in the practice of the most eminent Physicians, Surgeons, and Accoucheurs in Great Britain and on the Continent, with Practical Remarks; to which are added, observations on the Progress of Medicine, to the year 1810. By a Society of Practical Physicians and Surgeons. 10s. 6d. boards.

A Letter to Henry Cline, esq. on Imperfect Developments of the Faculties, mental and moral, as well as Constitutional and Organic, and on the Treatment of Impediments of Speech. By John Thelwall, esq. Professor of the Science and Practice of Elocution. 7s. boards. The Anti-Jacobin Review for April thus concludes a very ample account of this article: "We have now only to recommend to the reader this curious letter, which is well worthy the attentive perusal of every person above the sphere of manual labour."

Struve's Essay on the Art of Recovering Persons Apparently Dead; with the proper means to be adopted in Drowning, and other cases of imminent danger; particularly on Suspended Animation, and Observations on the Signs of Recovery, or Death; also on the various kinds of Poisons, &c. &c. &c. 12mo. 2s.

The Annual Medical Review and Register, for 1808, comprising a Critical Account of every publication relating to Medicine and Surgery which appeared during that year; together with a Historical Sketch of the Discoveries and Improvements in these and the Collateral Sciences within the same period; a Report of the general state of Health and Disease in the Metropolis; and a variety of Miscellaneous Intelligence. By a Society of Physicians. 8vo. 9s.

Culina; or, Receipts in Modern Cookery; with a Medical Commentary. By the late A. Hunter, of York, M. D. F. R. S. L. and E. A new edition. 6s.

Chemistry.

A System of Chemistry. By J. Murray, Lecturer on Chemistry, Materia Medica, and Pharmacy, Edinburgh. Second edition, enlarged, and containing the late numerous and important discoveries of Mr. Davy and others, 4 vols. 8vo. with plates. 2l. 8s.

A Dictionary of Practical and Theoretical Chemistry, including its application to the Arts and Manufactures, and to the explanation of the Phenomena of Nature, including throughout the latest discoveries, and the present state of knowledge on those subjects. With plates and numerous tables. By William Nicholson. 8vo. 20s. boards. This work, though formed on the basis of the Dictionary published several years since by the same author, in 2 vols. 4to., is in effect an entirely new work, the articles being either considerably enlarged, or entirely re-written, and in every instance adapted to the present improved state of Chemical Science.

A General Dictionary of Chemistry; or the leading Principles of the Science, in regard to Facts, Experiments, and Nomenclature. By W. Nisbet. 12mo. 8s. 6d. boards.

Materia Medica.

A Practical Synopsis of the Materia Alimentaria and Materia Medica. By Richard Pearson, M. D. Member of the Royal College of Physicians, and formerly Physician to the General Hospital, near Birmingham. A new edition, comprising the latest improvements in the London, Edinburgh, and Dublin Pharmacopœias, complete in one volume 8vo. 12s.

"This very useful and scientific work, which at first was published anonymously, was noticed by us in various stages of its progress with approbation. It is now avowed by a physician of eminence, and appears in an enlarged and improved form, and we can recommend this work of Dr. Pearson as a synopsis of the most useful and masterly kind." *British Critic.*

A Treatise on Diet, by an eminent physician.

Natural History.

British Fauna, containing a Compendium of the Zoology of the British Islands: arranged according to the Linnæan system. By W. Turton, M. D. F. L. S. 8vo. 10s. 6d.

An Introduction to the Study of Cryptogamous Plants. Translated from the German of Kurt Sprengle, M. D. With coloured Plates. 18s.

A Treatise on the External Characters of Fossils. Translated from the German of Abraham G. Werner. By Thomas Weaver. 8vo. 8s.

The Select Works of Anthony Van Luenhoek, F. R. S. Translated from the Dutch by Samuel Hoole. 2 vols. 4to. 24s.

The Natural History of British Insects, together with the History of such minute Insects as require investigation by the Microscope: the whole illustrated by coloured plates. By E. Donovan. Vol. xiv. 4to. 31s.

Miscellanies.

A Selection of the most interesting Cases that have occurred in the practice of the most eminent Physicians, Surgeons, and Accoucheurs in Great Britain and on the Continent, with Practical Remarks; to which are added, observations on the Progress of Medicine, to the year 1810. By a Society of Practical Physicians and Surgeons. 10s. 6d. boards.

A Letter to Henry Cline, esq. on Imperfect Developments of the Faculties, mental and moral, as well as Constitutional and Organic, and on the Treatment of Impediments of Speech. By John Thelwall, esq. Professor of the Science and Practice of Elocution. 7s. boards. The Anti-Jacobin Review for April thus concludes a very ample account of this article: "We have now only to recommend to the reader this curious letter, which is well worthy the attentive perusal of every person above the sphere of manual labour."

Struve's Essay on the Art of Recovering Persons Apparently Dead; with the proper means to be adopted in Drowning, and other cases of imminent danger; particularly on Suspended Animation, and Observations on the Signs of Recovery, or Death; also on the various kinds of Poisons, &c. &c. &c. 12mo. 2s.

The Annual Medical Review and Register, for 1808, comprising a Critical Account of every publication relating to Medicine and Surgery which appeared during that year; together with a Historical Sketch of the Discoveries and Improvements in these and the Collateral Sciences within the same period; a Report of the general state of Health and Disease in the Metropolis; and a variety of Miscellaneous Intelligence. By a Society of Physicians. 8vo. 9s.

Culina; or, Receipts in Modern Cookery; with a Medical Commentary. By the late A. Hunter, of York, M. D. F. R. S. L. and E. A new edition. 6s.

Researches into the Nature and Communication of Venereal Infection in Pregnant Women, New Born Infants and Nurses. By P. A. G. Mahon, Surgeon and Physician to the Venereal Hospital du Vangerard, Paris.

A Popular Treatise on Medical Police, and on Diet, Regimen, &c. by John Robertson, M. D. author of the Practical Treatise on the Powers of Cantharides, used internally in Gleet, Leucorrhœa, Seminal Emission, &c. &c. and extraordinary Member of the Royal Medical Society, &c. 2 vols. 8vo. 12s. boards.

Letters on Professional Character and Manners, on the Education of a Surgeon, and the Duties and Qualifications of a Physician; addressed to James Gregory, M. D. Professor of the Practice of Medicine in the University of Edinburgh. By John Bell, Surgeon, London. 8vo. 12s. boards.

Proposed British Publications.

Mr. Ramsden is about to publish some cases of the Cure of the Derangements of the Testicles, demonstrative of their being sympathetic with the Urethra: and to show that most of the diseases of that gland, hitherto deemed incurable, are perfectly within remedy. Also some cases of Hydrocele, in which the radical cure has been effected without recourse to any of the operations at present practised for that purpose.

Dr. Stock's Life of Dr. Beddoes is in the press. It will comprise an analytical account of the doctor's numerous writings, both published and unpublished.

Mr. John Thompson, professor of Military Surgery in the University of Edinburgh, and the Translator of Fourcroy's Chemistry, is preparing for the press a system of Surgery, in 4 vols. octavo.

Mr. Lee, Surgeon, will speedily publish an essay on Mortification.

Dr. Latham has in the press, Facts and Opinions concerning Diabetes.

Dr. Toulmin's Elements of the Practice of Physic are announced as ready for the press.

Speedily will be published, Practical Observations on Spasms of the Stomach, and other morbid Affections of that Organ, with Remarks on the Use of the Bile, in promoting Digestion. By George Rees, M. D. Member of the Royal College of Physicians, Physician to the London Dispensary, &c.

Dr. Bradley, the editor of the London Medical and Physical Journal, has nearly completed a work on the Practice of Physic.

Dr. Henry has in the press, Elements of Experimental Chemistry.

Recent American Republications.

Observations on the Diseases of the Army. By Sir John Pringle, baronet; late Physician extraordinary to the King, and Physician in ordinary to the Queen of Great Britain. First American Edition. With Notes, by Benjamin Rush, M. D. Professor of the Institutes and Practice of Medicine in the University of Pennsylvania. Edward Earle, Philadelphia.

The Principles of Midwifery, including the Diseases of Women and Children. By John Burns, Lecturer of Midwifery, and Member of the Faculty of Physicians and Surgeons, Glasgow. With Notes by N. Chapman, M. D. Honorary Member of the Royal Medical Society, Edinburgh; Member of the American Philosophical Society, and of the College of Physicians, Philadelphia; Lecturer on Midwifery, and the Diseases of Women and Children, Philadelphia, &c. &c. Edward Earle, Philadelphia.

A Dictionary of Practical Surgery: collected from the best and most original Sources of Information, and illustrated by critical Remarks. Including Observations on the most important Remedies, Applications, Instruments, &c.; a copious Pharmacopœia Chirurgica, and the Etymology and Meaning of the principal Terms. The Whole forming a complete Compendium of Modern Surgical Knowledge. For the Use of Students, private Practitioners, and Naval and Military Surgeons. By Samuel Cooper, Member of the Royal College of Surgeons in London. With Notes and Additions, by John S. Dorsey, M. D. Adjunct Professor of Surgery in the University of Pennsylvania. T. and B. Kite, Philadelphia.

The Modern Practice of Physic; exhibiting the Characters, Causes, Symptoms, Prognostics, Morbid appearances, and Improved Method of treating the Diseases of all Climates. By Robert Thomas, M. D. With an Appendix, by Edward Miller, M. D. Collins and Perkins, New-York.

Letters concerning Diseases of the Urethra. By Charles Bell. T. B. Waite and Co. Boston.

Original American Publications.

The American New Dispensatory: containing, General Principles of Pharmaceutic Chemistry; Pharmaceutic Operations; Chemical Analysis of the Articles of Materia Medica; Materia Medica, including several new and valuable articles, the production of the United States; Preparations and Compositions. With an Appendix; containing, Medical Prescriptions; the Nature and Medical uses of the Gases; Medical Electricity; Galvanism; an Abridgment of Dr. Currie's Reports on the Use of Water; the Cultivation of the Poppy Plant, and the Method of preparing Opium; and several useful Tables. The whole compiled from the most approved authors. By James Thacher, A. A. and M. S. S. T. B. Wait and Co. Boston. 1810.

The American Medical and Philosophical Register; or Annals of Medicine, Natural History, Agriculture and the Arts. Conducted by a Society of Gentlemen. Ezra Sergeant, New York.

Report on the Spotted, or Petechial Fever, made to the Counsellors of the Massachusetts Medical Society, on the 21st June, 1810. T. B. Wait and Co. Boston.

Proposed American Republications.

Adams's edition of John Hunter's Works; with notes, by N. Chapman, M. D. Ed. Earle, Philadelphia.

Thompson's Elements of Chemistry.

Bree, on Disordered Respiration and Asthma. T. & A. Humphreys, Philadelphia.

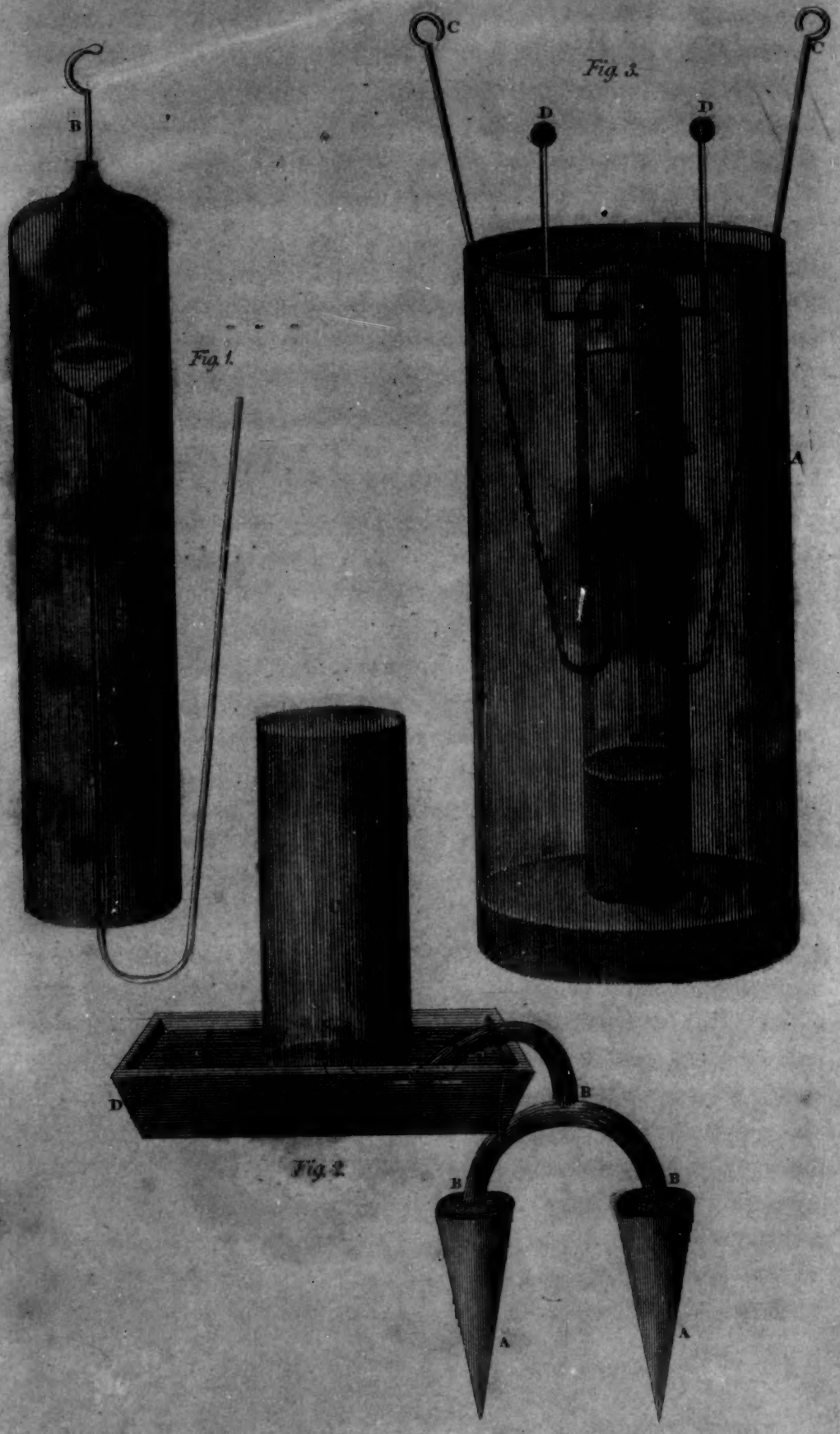
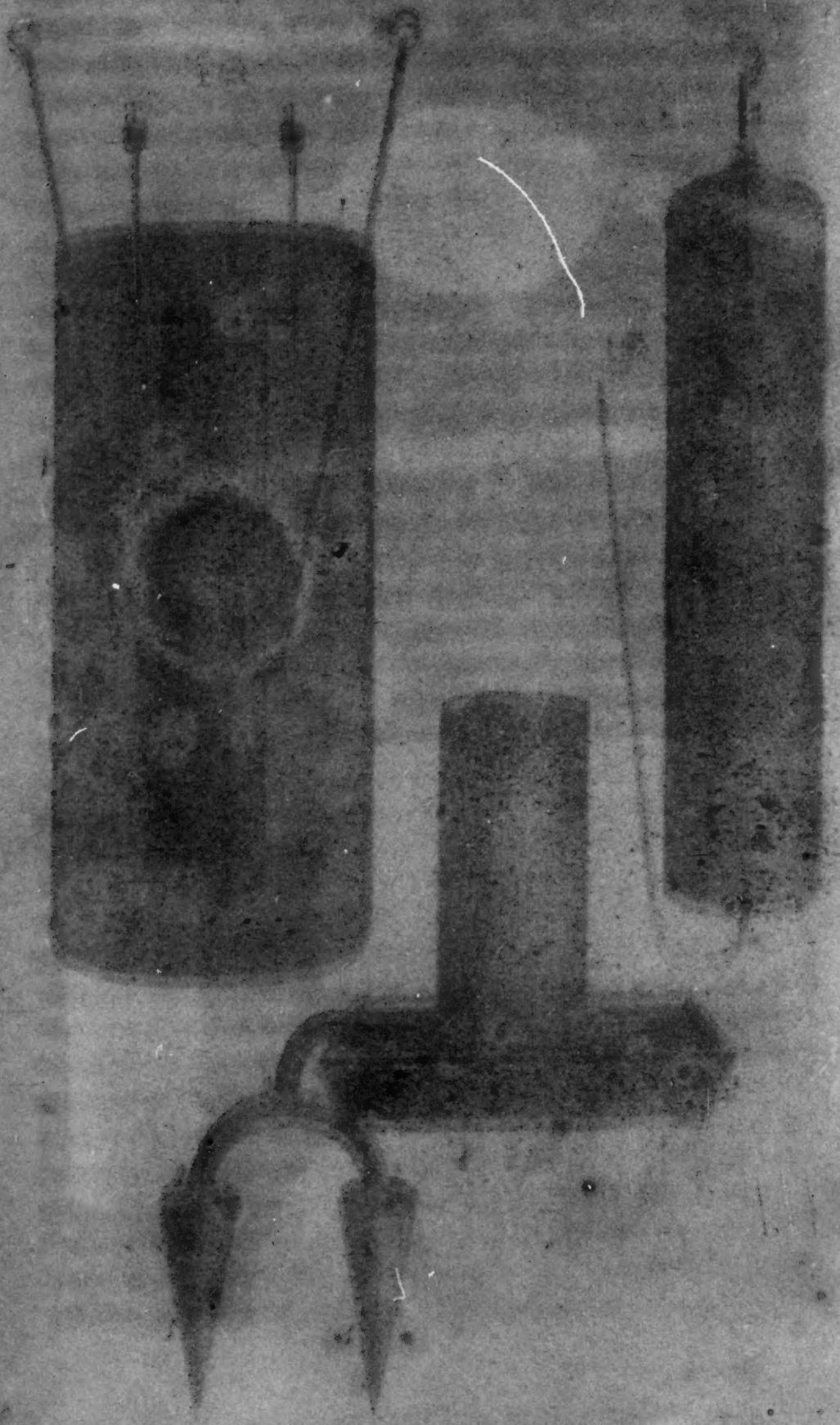
An Essay on the Causes of the Variety in the Human Species: to which is added, Animadversions on certain remarks made on the first edition of this essay, by Mr. Charles White, in a series of Discourses delivered before the Literary and Philosophical Society of Manchester, in England. Also, Strictures on Lord Kaimes's Discourse on the Original Diversity of Mankind. By the rev. Samuel Stanhope Smith, D. D. President of the college of New Jersey, and member of the American Philosophical Society. The second edition enlarged and improved. J. Simpson and Co. New-Brunswick, New Jersey.

Proposed American Original Publications.

A System of Anatomy. By Caspar Wistar, M. D. Professor of Anatomy in the University of Pennsylvania. T. Dobson, Philadelphia.

From the acknowledged talents of the author, and from his ample experience as a teacher of Anatomy, the public have a right to indulge the highest expectations respecting this work.

Elements of Zoology. By Benjamin S. Barton, M. D. Professor of Materia Medica, Natural History, and Botany in the University of Pennsylvania,

Every cultivator of natural history must feel an anxiety for the appearance of this work. We learn that a considerable portion of it is already printed, and that the work will be published without much further delay.

Professor Davys electro-chemical apparatus